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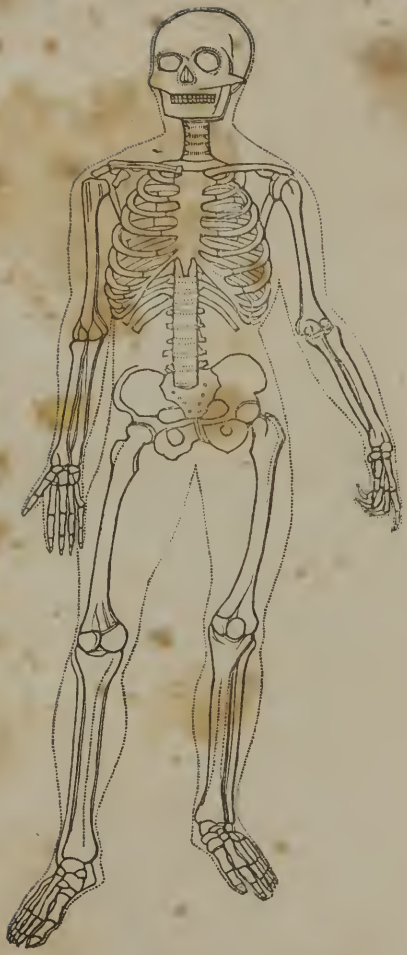
PEASE—MORSE.—Thursday morning, Jan. 19th, at the residence of the bride's father, by the Rev. C. M. Howard, Mr. Buel D. Pease to Miss Esther W. Morse, both of Hyde Park.



I am fearfully and wonderfully made. *Ps.* CXXXIX

THE

PHYSIOLOGICAL

FAMILY PHYSICIAN,

DESIGNED FOR

FAMILIES AND INDIVIDUALS.

By CALVIN CUTTER, M. D.

WITH MORE THAN 100 ENGRAVINGS.

WEST BROOKFIELD:
MERRIAM AND COOKE, PRINTERS.
1845.

INTRODUCTION.

In presenting this work as a guide to the Mother and others, whom duty compels to treat the "ills that flesh is heir to;" a few words relative to its character may not be unimportant.

The points of difference between this work and others of a similar character, are these:

1st. The structure of the different organs is described, and their position illustrated by many engravings—making the work one of popular anatomy.

2nd. The functions (or uses) and laws of the different organs of the system are familiarly explained; thus, making it interesting and profitable as a work on Physiology.

3rd. The common diseases are explained in connexion with the anatomy and physiology of the various organs of the system and the *safe* and *proper treatment* detailed so clearly and minutely as not to be mistaken.

By the combination of the structure, functions, and diseases of the system, the whole

will be found of practical utility, and may correct many errors that now prevail in the community.

The facts in this treatise have been derived from various sources embracing the opinions of the first medical writers and practitioners in our country.

If this treatise is the means of directing aright domestic or home medication, the efforts and earnest wish of the writer have not been in vain.

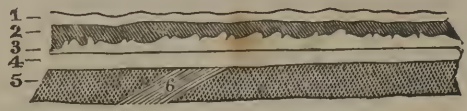
CONTENTS.

LIST OF CUTS.

FAMILY PHYSICIAN.

THE skin is composed of three parts, viz. the *cuticle* or *epidermis* sometimes called the scarf skin; the *rete mucosum;* and the *curtis vera*, *corion* or true skin. These combined form the animal membrane called the skin.

Fig. 2.



1. The cuticle, or scarf-skin.
2. The rete mucosum, or colored stratum of the skin.
3. The papilla of the skin on the surface of the true skin.
4. Cutis vera, or true skin.
5. The subcutaneous cellular tissue.
6. Some fibres of the cutaneous muscle.

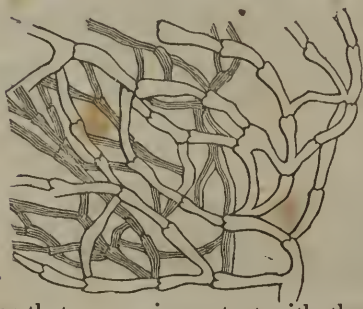
The CUTICLE has no nerves or blood vessels. If wounded there is no pain experienced and no blood will ooze from it. This membrane is thickened by friction, so that the laborer can pursue his indurtrial employment without suffering. It is useful in protecting the blood vessels and nerves that are embedded in the true skin. It is likewise useful in preventing the absorbents from conveying injurious matter into the system.

The RETE MUCOSUM called the mucous coat, lies immediately beneath the cuticle. This is the coloring tissue of the skin. In the African it is black; Mongolian, yellow; Indian, copper colored; Caucasian, white. It gives some protection to the blood vessels and nerves.

The CUTIS VERA called the true skin contains *nerves*, *absorbent vessels*, *arteries*, *veins*, and *sudoriferous* or *sweating glands*.

The NERVES are spread over every part of the true skin, but in some parts they are more abundant than in others. They are more numerous in the upper than lower extremities, in greater numbers upon the palm than the back of the hand.

Fig. 3.



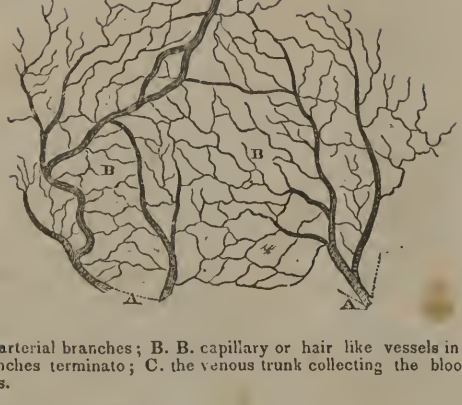
This engraving represents a plexus of Lymphatic or absorbent vessels in the skin considerably magnified from an injected preparation.

The office of the absorbents is the taking up and conveying in to the system, matter that comes in contact with their extremities. These vessels act most efficiently under the following circumstances:—1. When the system is not supplied with a proper quantity of food. 2. When the skin is moist or damp. 3. When the cuticle is removed. In visiting and watching with the sick, traveling through marshy districts at the South, working in rooms containing poisonous vapors, the skin and clothing should be kept dry, the room well ventilated, the system supplied with a proper amount of food, and the cuticle protected if broken.

The ARTERIES are the small tubes or vessels through which the blood that nourishes the skin passes.

The VEINS are the small vessels through which the blood that is impure and dark is returned from the skin. These vessels sometimes become enlarged. This is the case when *Toddy blossoms*, so called, are seen upon the face and nose of Rum drinkers. The same is true in some cases of other diseases of the skin.

Fig. 4.



A. A. arterial branches; B. B. capillary or hair like vessels in which the large branches terminato; C. the venous trunk collecting the blood from the capillaries.

The SUDORIFEROUS or sweat glands are minute organs placed in the true skin. The tube or duct that leads from them opens under the cuticle or scarf skin.

These glands exist in great numbers in the skin. By their united action something like two pounds of decayed, waste, and useless matter is carried from the system every twenty four hours. This usually passes away in the form of insensible perspiration. If it becomes perceptible it is called sweat.

These glands act most efficiently under the following circumstances:—1. When the system is adequately supplied with food. 2. When the clothing is dry, porous, and loosely worn. 3. When the air is clear and dry.

That the skin be maintained in a healthy state, the following conditions should be observed.

CLOTHING.

1. In all cases, sufficient clothing should be worn to prevent any sudden chills. 2. It should be worn loose upon every part of the system. 3. It should be porous

Fig. 5.

This engraving represents sudoriferous or sweat gland, from the palm of the hand magnified, 40 diameter. *a. a.* contorted tube composing the gland and uniting with two excretory ducts *b. b.* which uniting one form spinal canal that perforates the epidermis *at c.*, and open on its surface at *d.* The glands are embedded in fat vesicles which are seen at *e. e.*

like woolen and cotton cloths. 4. It should be frequently changed and kept clean. 5. If it becomeswe or merely damp by free sweating, by the dampness of evening or by exposure to showers, it should be changed. 6. In these cases the skin should be wiped dry, and smartly rubbed before putting on dry fresh clothing.

7. Every person needs an additional garment when leaving a warm room and going into the open air. These simple rules should be observed by every man, woman and child.

BATHING.

The insensible perspiration or sweat that is separated from the blood is composed of water, salt, oil, rust of iron and some other articles. The water will evaporate or dry off, leaving the salt, oil and other substances as residual matter upon the skin. This forms a species of varnish that will obstruct the ducts of the sudoriferous glands. To remove this residual matter, daily ablution is needed. The warm, the vapor, and the cold bath are useful for this purpose. By bathing frequently the circulation of the skin is maintained in a healthy condition and the waste matter steadily eliminated from the system.

After bathing, wipe dry, and rub the skin with a coarse towel. By so doing, there is no danger of contracting a cold. If the skin be dry and inactive in acute or chronic disease, bathing and friction are of vast importance. Many cases of disease can be removed without medicine by attention to bathing. In all cases after bathing, exercise is important, and should not be omitted, when it can be taken. If a cold bath leaves a chill upon the system, use the tepid, warm or vapor bath in its place. The following from the Boston Morning Post, is the *ad rem*.

"*The cheapest and best bathing apparatus*—a small tub, a wash bowl, a sponge, and a coarse towel. Our correspondent, Experience, takes a shower of ice water like a hero, many will think, but to him it is a luxury. Many constitutions cannot bear the shower; such may profit by the sponge and friction. Many again cannot bear *cold* water—take warm water, then. But, at all events, bathe! If possible, use *cold water*. There is the virtue in it that was in the pool of Siloam."

BURNS AND SCALDS.

These injuries, in the first stage, are generally treated by the mother, or some female friend, and it is necessary that they have definite information as to the treatment of them. It is common to see these injuries treated by the application of acids, alkalies, anodynes, and irritants, applied either hot or cold. These diverse articles are applied in all ways, and in all quantities. Those who advise these articles, and who apply them, will assert that the results of the use of the advised article are the best, and that such has *always* been known to be the case. Now if the anodyne is the proper remedy, the acid cannot be; and so of the other-named articles. These articles are usually recommended and applied for two reasons. 1st. They are good to take out the fire. 2d. They are excellent to heal the parts. Some question whether it is needful to apply any thing for either of these purposes. What evidence is there, that fire exists in burns or scalds? The fact that the scarf-skin has been removed, is no evidence, as it proves too much. For this part of the skin may be removed by a mustard paste, or by friction, or by acids, as readily as by hot water. In these cases, no one will pretend there is any fire to take out,—yet the evidence from the scarf-skin being removed, is as conclusive in favor of extracting the fire in these instances, as in the other. Some assert, that so long as the smarting continues, so long is there fire in the parts. There is smarting in all instances where the scarf-skin is removed, more or less intense. If smarting is an evidence of fire, we can prove that the subtile destroyer has a hand in all the instances in which the skin is removed,—the nervous system being in a healthy state. The cause of the severe smarting in scalds, is the effect of the heat of the water exciting an increased flow of blood to the nerves, and the sentient extremities being exposed to the unaccustomed stimulus of the air and heat. If the heat was applied in a gradual manner, the smarting would be much less.

This is also true in the application of irritating stimulus to the skin; the nerves and vessels adapt themselves to the action of the stimulus, thus the pain is diminished.

Many things are applied on account of their healing properties. We will now examine the manner in which any wound of the skin is healed. It is not by any external application, but by the blood vessels throwing out a quantity of albumen. This is at first soft, then it gradually hardens, and becomes thickened. The coloring, or mucous membrane, is repaired in the same way; the true skin, or cutis vera, if destroyed, is never restored, as is seen in the scars that afterwards remain. In all instances the work of reparation is done by the arteries, and the material for reparation is taken from the blood. There is no healing property in salves, or ointments, notwithstanding the assertion of doctors, and the profound belief of mothers. Such being the case, no article need to be applied simply because it is healing. The question may arise, how should a burn, or scald, be treated. I will answer, by applying some article that shall shield the exposed and smarting nerves from the air, and other irritating substances. This substance acts, for the time being, in the capacity of the removed carf-skin. A poultice made of slippery-elm bark, thick fresh cream spread on fine linen or cotton cloth, beeswax and lard melted together, sweet oil and lime water, mixed into a linament, are good applications. In short, any soothing, emollient article may be applied. Care should be taken, that the dressing be not too frequently changed, as the opening of the dressing exposes the sentient nerves to the air, while they are highly impressible. Burns, if very extensive, become dangerous from the irritation induced in the nervous system generally. In all such extreme cases of burns and scalds, medical aid should be called immediately, as they are often followed by diseases of the brain, lungs, liver, and other internal organs,—hence the danger.

If the burn is deep, that is, destroying the true skin, it would be well to seek the advice of the family physician,—particularly if the burn be about the joints, or

between the fingers, special care should be given that the movement of the finger, or limb be not impaired, or destroyed. If the mother sees the child, before the hot water has produced a blister, the object will be to prevent a blister from forming. If you observe a portion of the skin, on which hot water has been poured, the part will become intensely red. Soon a small blister will be seen at one point, then one at another, until the entire surface is covered with one continuous blister,—all the small ones uniting to form one large blister. In all such cases if the action of the blood vessels be suppressed, there would be no blister. This can be effected by applying cold water steadily, giving no opportunity for reaction, or an increased flow of blood to the parts. It is upon this principle that cold applications are used to frost-bitten limbs, to prevent the rapid reaction of the blood, causing blisters.

The following is a valuable receipt for burns.

Bees Wax.
Rosin.
Lard, of each, 1 ounce.

Melt together, then add while they are cooling, one ounce of spirits of Turpentine. Spread this ointment upon cotton or linen cloth and apply it to the burn.

FREEZING.

Many persons lose not only their limbs, but their lives for want of knowledge to direct them, with ears, face, fingers, or toes benumbed with cold—perhaps frozen, they rush at once to the fire, thus completing that destruction begun by the frost. A little timely care will prevent this.

Every one knows that if frozen meats, fruits or roots of any kind, be brought near the fire, or put into warm water, they will be destroyed by rottenness, or a kind of mortification ; and that the only way to recover them is to immerse them, for some time in very cold water. The same observation holds with regard to animals in this condition. When the feet or hands are

much benumbed with cold, or frozen slightly, they should be immersed in cold water, or rubbed with snow, till they recover their natural sensibility and warmth, at first the sufferer should not go to the fire or into a warm room. In a little time he may be removed to a room moderately warm, and receive a little warm drink, as sage or balm tea, or a piece of toasted bread. Should the frozen parts be followed by blisters, treat them as directed in the section on burns.

CHILBLAINS.

There are many causes for this complaint, but perhaps the most common is the application of long continued cold. If a person's feet get chilled, heat them, as directed in the section on Freezing.—When the chilblain has manifested itself, bathing with cold water, laudanum, camphorated spirit, or equal parts of olive oil, and the spirits of ammonia, would be good.

RING-WORM.

This is an affection of the skin, that presents itself in circular patches. Around the margin, there are small vesicles while the central portion is red, tender, and disposed to peel off in branny scales. A single patch will run its course in four or six weeks, but it is often succeeded by others for a long time.

Treatment.—Astringent washes, as a solution of the sugar of lead, white vitriol, and borax may be used. Sometimes cranberry juice will be found efficacious. Laudanum, and tincture of Iodine are excellent applications.

CORNS.

The proper treatment of corns is very simple—and if faithfully attended to, almost certainly successful. Let the part be well soaked in warm water; then with a sharp

knife, pare away the summit of the excrescence, until it is level with the sound skin or a little depressed below it. In the next place, provide some buckskin well coated with good adhesive plaster. Take a circular piece of this about three times as great in diameter as the corn, and cut a hole in its centre, a little longer than the base of the corn. The plaster is now applied around the excrescence; which occupies the central space so that nothing can press upon it. The cause being thus removed, the disease soon disappears. If the corn should grow rapidly for a time, let it be frequently retrimmed and the plaster re-applied.

When corns occur between the toes, it is impossible to surround them, and it is then best to place one or two layers of the buckskin between the points of the toes, so as to keep them permanently apart;—but let it be remembered that the application of a dressing directly over the excrescence tends to increase rather than diminish it.

Under the foregoing treatment, perseveringly and judiciously applied, we believe that a cure will invariably take place in a reasonable time.

NAILS GROWING INTO THE FLESH.

Treatment.—By raising the nail, and putting cotton under it, so as to keep off the soft parts, and by cutting the middle of the nail then, so as to make it flexible, temporary relief may be given. The most effectual remedy is the application of lunar caustic to the whole sore surface, and repeating the caustic once a week if necessary, until the soft parts recede from the nail. The first application is often attended with considerable pain, but the succeeding ones, when required give much less inconvenience. This remedy is usually successful. Poultices are employed for a couple of days after each application of the caustic, and simple cerate during the remainder of the interval.

RUN ROUND.

This is an affection of the fingers and toes. It is an inflammation around the sides and base of the nail. It is attended with a ring or semi-circle of redness, with considerable swelling, pain and extreme soreness. Purulent matter is soon deposited beneath the cuticle.

TREATMENT:—Evacuate the matter, then apply a poultice for two or three days, all the loose cuticle should be carefully removed with the poultice.

After the cuticle is removed, it will be found moist and studded with minute ulcerations. The affection should then be dressed with a cerate made of lard and beeswax.

MEASLES.

The commencing symptoms of measles, are developed from ten to fourteen days after exposure. They are a tickling sensation about the nostrils, with sneezing, watering of the eyes, dry husky cough, and in general, the appearances presented at the out-set, are like the symptoms of a catarrh. The fever is indicated by the usual symptoms. On the fourth day of the fever, the eruption makes its appearance. At first in deep red, distinct pimples, that become fainter and more confused as the disease advances. They collect in patches of an irregular form, which at intervals nearly disappear. Upon the appearance of the rash the febrile symptoms are not relieved, but sometimes much aggravated. The fever continues while the eruption lasts. This abates on the fourth day. The cough, with tenderness and inflammation of the eyes, may continue after the fading of the eruption.

Treatment.—Active medical treatment, is not usually required in measles. The eyes should be protected from the light, laxative medicine may be given, the catarrh may be relieved by drinking barley water. The skin should be shielded from currents of air. Sometimes

the difficulty of breathing, and cough, may be mitigated by steaming the head with vinegar. If there is much pain and cough call in a Physician.

At the commencement, measles are liable to be confounded with scarlet fever. But let it be remembered that in the last disease there is no sneezing and no watering or swelling about the eyes, which in measles are always present.

SCARLET FEVER.

"The eruption which is nearly simultaneous with the fever, consists at first of minute red points, soon confounded in a general flush which extends itself over the whole surface, but is chiefly manifest on the face and breast. The color of this flush is a bright scarlet, not seen in measles, nor in any other diseases. On close examination the small points of the skin will still be found inflamed, and slightly prominent; but the roughness thus produced has not the coarseness felt in measles. The appearance of a full and extensive efflorescence is a favorable sign; for the fuller the eruption, the milder will be the febrile symptoms, and the affection of the throat. The approach of the latter, which may occur as soon and even sooner than the rash, is marked by a difficulty of swallowing, and sense of soreness. On examination, the tonsils and the neighboring parts of the passage are found swollen and intensely red, and in a short time patches of a white or ashy color are observed, which indicate that ulceration of the mucous membrane has already taken place, as the swelling and ulceration increase, every attempt to swallow is attended with much distress, and frequently liquids taken into the mouth are forced into the nostrils. During this state of the parts the fever suffers no permanent diminution, and little remission; the thirst is extreme, the skin hot, headache intense, the sleep broken by dreaming, starting and twitching of the limbs; and not unfrequently delirium is present. The eruption perhaps after fading, and re-appearing finally subsides. On the sixth or seventh day of the fever, the whitish

sloughs are loosened and throw off, the ulcers heal, with relief to all the symptoms, and in favorable cases the disease terminates from the sixth to the ninth day."

TREATMENT:—In treating this disease as its absolute arrest, by any means is not to be expected, three objects are to be kept in view.

1. To moderate the violence of the febrile action.
2. To subdue those symptoms that immediately threaten life.
3. To counteract debility.

For the first purpose, the principal which has been relied upon is cold, applied externally to the surface by sponging and bathing, and internally by the use of iced water and ice itself, other means of moderating the fever are offered by the administration of the neutral salts, as the nitre and epsom salts in small quantities. The second object is to be answered, in cases where the inflammation and swelling are excessive, by general bleeding and the abstraction of blood from the neck by leeches. The third is the most important, as the stage of debility soon arrives, and the condition of the system that accompanies it, must be promptly met: as soon then as the active form subsides, if a state of languor, prostration and debility succeed; if the tongue remains coated, the bowels torpid, and the spirits depressed; especially if the ulcers refuse to heal, and assume a foul and unhealthy aspect, no time is to be lost; bark, wine, and the acids, must be given internally, gargles of the same character employed for the throat, and every means resorted to, for preventing irritation of the digestive system, and supplying it with mild nourishment. In these cases it is well to consult a judicious physician only.

THE CELLULAR TISSUE.

The skin being removed, the cellular integument presents itself, which connects the different parts. The small amount of matter composing this membrane is arranged in a cellular form. It is seen between all the organs and parts of the system, uniting not only the larger

organs, but connecting the smallest fibres. By some anatomists it is regarded as the primary tissue of the system. The matter that gives firmness and solidity to the bones deposits itself in the meshes of cellular tissues. The same may be said of the muscles, and other organs of the system.

Fig. 6.

Here is a drawing of a single film of cellular membrane lifted up and slightly enlarged.

In the disease termed general dropsy, the serum of the blood, called water, is found in this tissue. The cells that compose this membrane, open into, or connect with each other. This arrangement and connection will explain the often noticed fact, that in general dropsy, the feet will be much swollen at night, and the face will be contracted. In the morning, after being in a recumbent position several hours, the fullness of the limbs has abated, and the face is much bloated or swollen. The fluids pass from one cell to this membrane to another. The same is illustrated in cases of emphysema, when the tissue is distended with air. A living animal may be blowed up, as we do a bladder, by puncturing the skin and introducing a pipe. This is sometimes seen in fracture of the ribs, where the rib punctures or wounds the lungs. The cellular tissue is found in the lungs, stomach, intestines, connecting the other parts together. The same is true of the bones and tendons, called in common language the sinews, or cords, which are thought to be condensed cellular tissues. The same is true of the connecting ligaments of the bones, and cutisvera, or true skin.

BOILS AND ABSCESSES.

Boils and carbuncles have their origin in this part of the system. From some cause, not so well known, a small part of this texture loses its vitality. This dead portion is the nucleus, around which the matter accumulates. This dead matter forms what is called the core of the boil. In all cases of diseases of the character of common boils, or abscesses, there should be a free and early opening made into the diseased part. The waiting until the "boil" has come "to a head" until "it is ripe," in the common acceptation of the term, is not good policy. If the system be in an unhealthy state, the purulent matter will extend between the muscles in the meshes of the cellular membrane, doing a vast amount of mischief. In all instances the abscess is "fit to open" as soon as the smallest amount of matter has been deposited by the diseased action of the vessels in this part of the system.

Before and after the boil or abscess is opened, an emolient poultice may be applied. The poultice may be made of ground slippery elm bark, flax-seed meal, or bread boiled in milk.

ADIPOSE TISSUE.

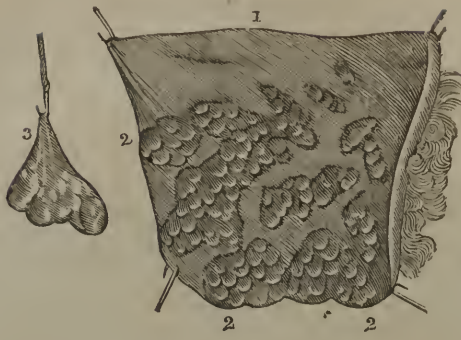
The substance called *fat*, but named adipose matter, is deposited in distinct bags that are seen in the loose cellular membrane.

Fig. 7 gives a representation of the adipose tissue.

ADIPOSE TUMORS.

In some instances the masses of adipose matter called *pelitongs*, becomes enlarged or hypertrophied forming adipose tumors. Friction with linaments and ointments do no good when applied to such tumors. In all cases, either let them alone or have them removed with the knife.

Fig. 7.



1. A portion of the adipose membrane. 2, Minute bags containing fat. 3, A cluster of those bags, separated and suspended. In persons very corpulent, there is an accumulation of adipose matter in these bags.

MUSCULAR SYSTEM.

Beneath the fat found under the skin is presented the tissue named the muscular. In common language, this is called the lean meat, or flesh of the system. Each muscle is composed of minute fibres, or threads: each fibre, however small it may be, is surrounded by a semi-transparent membrane. They are bound together and form by their union a muscle, terminating at either extremity by a smooth, silver-like tendon. These tendons attach themselves to the enlarged extremities of the bones. By boiling a piece of lean meat, these threads can be distinctly seen covered with their thin investing membrane, and also the termination of the mass of fibres into a firm resisting tendon, and the attachment of the tendon to the bones. The arrangement of the muscles of the ox, is similar to the formation and structure of the muscles in man, which can be examined by all.

There are about 400 muscles in the system, attached to the 250 bones. They are arranged in pairs, with a few exceptions; that is, if there is a muscle of a certain form, and in a certain position in one arm, there will be

found one of a similar form and position, in the other. This arrangement of the muscles renders the system

Fig. 8.

EXPLANATION OF FIG. 8.

"*a*, upper portion of the *trapezius*; *i. sterno cleido mastoideus*; *d*, the *deltoid* portion of the *trapezius*; *f*, the *latissimus dorsi*; *n*, *n*, *n*, *n*, portions

of the latissimus, rising by digitations from the ribs; *g*, and *b*, tendinous continuation of the latissimus into fibres of the gluteus maximus; *h*, the deltoides muscle, to raise the arm; *k*, *e*, *m*, the infra spinatus, belonging to the shoulder; *c*, the clavicular portion of the deltoides; *l*, the intermingling of the fibres of the gluteus maximus and latissimus dorsi.

"The artist was particularly fortunate in delineating the muscles in the accompanying diagram. No plate could more accurately show the relation which one bears to the other, nor more truly represent the converging fibres, all centering in the tendons. As in the demonstration of the eye, it can also be said here, that there are coats of muscles on the back and sides. One overlaps the edges of the other, in such a perfect manner as to leave no deep spaces: an even covering is thus spread over the skeleton. The latissimus dosi, marked *f*, is one of the most beautiful in the body; and its utility is proved every moment. Its office is to bring down the hand. Before man invented instruments which have superseded, to a considerable extent, the primitive use of the hand in some particulars, the fist was a mallet, the arm the handle, and this muscle the power that gave force to the blow. Those mechanics who are constantly using hammers, and axes increase its size and strength amazingly If the arm be firmly fixed, in a horizontal position, the digitations marked *n*, *n*, *n*, *n*, by their strong hold upon the false ribs, would open the bottom of the chest quite effectually. Over the shoulder joint, and from thence running to the middle of the arm bone, is a splendid muscle—the deltoides, marked *h*, which raises the arm to a level with the shoulder; its lateral portions even carry the elbow very much above the level of their origin. If it were divided, no remaining muscle could perform its office. Just above *f*, winding partially under the deltoides, is that muscle which extends the arm. The name of the triceps extensor cubiti is given it, because it arises by three heads, which uniting in one tendon, passes the elbow joint on the back of the arm, to be inserted in the ulna, or, as the back bone is sometimes called, the cubit. Lastly, *k*, *e*, *m*, directs the eye to the infra spinatus, arising on the external surface of the shoulder blade, and inserted into the arm bone. By its contraction the arm is raised a very little, and carried backward; its tendon, as it passes over the shoulder joint, adheres to the capsular ligament and keeps it drawn out, so that it may not be pinched by the rolling motion of the ball in the socket.

"A provision analogous to this double office of the triceps tendon over the back of the elbow exists in the knee, ankle, and several other joints. Owing to the little elasticity of the capsular membrane, there is a tendency, in consequence of the pressure of the tendons running over the articulation, to force them into the cavity made by bending the joint, where they would inevitably suffer violence when the ends of the bones came into place again, were there not a mechanical contrivance to prevent it. As soon as the flexors begin to act, some other muscles or parts of muscles at the same instant also begin to pull the surrounding ligament out from the depression: thus it is kept from being pinched and ultimately ruined by the injury it would sustain."

symmetrical, and relieves the sharp prominence that the bones would otherwise produce. In muscular, hard working men, the rounded outlines of the playful and healthy child, or beauty of the female form, are not seen, because the interstices between the skin and muscles are not filled with fat. Among the working men, those of rounded limbs have more of the adipose matter, than those of the opposite character.

The muscles have passing through them many hollow tubes, named arteries and veins. Some of these vessels

are very minute. Through these vessels the blood is passed to and from the muscles. These two sets of vessels are placed by the side of each other, the red blood flowing through the arteries from the heart, and the dark or venous blood passing through the veins from the muscles to the heart. These vessels are accompanied by fine white cords, which are the nerves; by the agency of which, the action or contraction of the muscles is induced.

The color of the muscles varies in different persons, and animals. Among animals and men that have red blood, those that have the purest blood, will have very red muscles. In diseased persons, the intemperate, for instance, the blood is dark, and the muscles also, are of a dark color. If there is a deficiency of red globules in the blood, the appearance of the blood and muscles will be very pale. In some fish where the blood is white, as in the cod, the muscle or flesh, is white. If an animal be killed suddenly, by opening the heart, or large vessels, and permitting a large amount of blood to flow in a little time, the muscles will be very red; on the other hand, drain all the blood from a portion of flesh, and it will become white. This shows that the color of the flesh depends upon the color and quantity of blood in its thousands of arteries.

The *peculiar character or office, of a muscle, is its power of contracting, or shortening.* In bending a joint, as the elbow, for example, the extremity of one muscle is found attached to the shoulder bone, which acts as a fixed point; the other extremity makes its attachment to one of the bones of the fore-arm. The scapula being fixed and immovable, the muscle contracting will move the bone of the fore-arm, to which it is attached, causing the elbow to bend. On this principle, all the joints of the system are moved. When the fibres of a muscle contract, the two extremities are brought near each other, the contracted part of it, or the belly, becomes fuller, harder, and more prominent. Thus the muscle loses nothing by contracting.

Fig. 9.

Fig. 10.

EXPLANATION OF FIG. 9.

"*f, extensor digitorum communis*, for extending the fingers; *h, extensor proprius minimi digiti* to extend the little finger; *f*, where it unites with others; *i, extensor carpi ulnaris; l, anconeus, extensor ossis metacarpi pollicis; e extensor primi internodii pollicis; e, extensor secundi internodii pollicis; d, indicator; g, annular ligament of the wrist; k*, an abductor of the little finger; *e, supinator radii longus.*"

EXP. OF FIG. 10,—*d, e, flexor digitorum sublimis*, attached to the second bone of each finger, by four tendons, to bend the second joint; *f, h, flexor longus pollicis manus*, to bend the thumb; *a, b, c, pronator teres*, to pronato the hand; *g*, a slit in the tendons of the flexor digitorum, for the passage of four other tendons of another muscle which go to the points of the fingers, for bending the last joint."

If the contraction of a muscle continues a long time, it becomes exhausted, and will soon relax. Compel a boy at school to hold his arm horizontally as a punishment. The muscles forming the prominent part of the shoulder contract to raise the arm. In a little time the contracted muscles relax, and the arm drops to the side. It is a law of the muscular system, that relaxation follows contraction. This is important to be remembered in schools, and other employments. The muscles exercise great influence upon the system. It is by their contractile power that we are enabled to pursue different employments. By them, the farmer cultivates his field, the mechanic wields his tools, the author drives his quill, the sportsman pursues his game, the lady sweeps the keys of the piano, the orator gives utterance to his thoughts, and the young are whirled in the mazy dance.

1st. It is a law of the system, that the action and power of an organ are commensurate to the demands made upon it. 2d. The power of an organ is increased in proportion to this action. This is done by increasing the activity of the terminal vessels, and thus stimulating the energies of the organ. The increased activity of these hair-like arteries, invites more blood to the part,—to the large, as well as the small vessels lying between the bodies of the muscles, and the many small fibres of the same. The contraction of the muscular fibres presses upon the vessels and increases the activity and energy of the circulation in the part. Thus more blood is sent to the used organ not only to repair the waste, but to promote the size of the organ. Compare the arm of the smith who works at the anvil, with the limb that has been suspended in a sling—the arm of the one will be large, hard, and firm to the touch, whilst the other will be slender and flabby. In the one instance, an ample supply of the nutrient blood is sent to the one limb, while to the other there is not. The action of the vessels in the one is energetic, the other sluggish. Let the inactive boy and girl, or gentleman and lady, be reminded of this when complaining of want of strength, loss of appetite, depressed spirits, when they are continually seeking some sovereign remedy for their complaints,

apparently unmindful that God, in his infinite benevolence, has adapted the bones and muscles for action.

The development of man requires that there should be no compression of the muscular system. If there is pressure on any part of a muscle, it becomes pale, and diminished in size—the circulation of blood is retarded through its vessels, diminishing the nutrient material that sustains it. In the case of a man with a fractured limb, ashe does not exercise the parts while the bone is repairing the muscles will be diminished and enfeebled; and, in addition to the inaction of the muscles, they are compressed by the dressing. Limbs enfeebled in this way do not recover their size, tone, and strength, until the bandages are removed, and a proper amount of exercise is taken to restore the energies of the muscles.

Again, we learn that the action of a muscle is most effective where there is a liberal supply of food, and healthy digestive organs. The reason is obvious: when the blood is renovated by a proper quantity of nutrient chyle, it is fitted to stimulate the muscular fibres to energetic contraction. Thus we notice that the dyspeptic man, and half-famished horse have but little strength. Increase the amount of food to the animal, and restore the deranged state of the organs of digestion in man, and there will be a changed condition in the muscular system.

Muscular action is more efficient in the open air, than in a confined room. The chyle from the food is purified, or changed into blood, by the air in the lungs. When the air is pure and abundant, the chyle is more perfectly changed, the blood is rendered more stimulating, and imparts more vigor to the muscular fibres, than when the chyle has been subjected to the action of impure air. We see this illustrated by the ease, and apparently slight fatigue that invalids endure in riding four or five miles, whereas if sitting in the confined air of a room the same length of time, they would be almost exhausted. By this, the invalid may learn the expediency of being in a well ventilated room, and breathing the pure air. The mechanic needs muscular strength to ply his tools; if the room where he works and sleeps, has constantly pure

air, he can perform double the amount of labor that he otherwise could do, when breathing impure air. Birds have more strength, in proportion to their size, than other animals, or men. This is caused in part by their inhaling pure air constantly, and having a more voluminous apparatus for respiring. The air of work shops, and sleeping rooms, should be as pure the whole time as the atmospheric air.

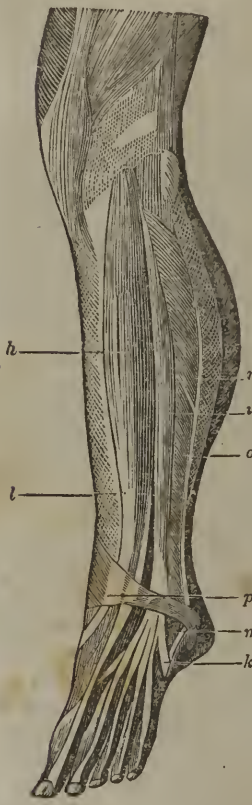
The growth and health of muscles require cleanliness, and warmth of the skin, that the exhalent vessels may carry off the redundant matter of the system. This redundant waste of the system, if separated from the circulating fluid, and conveyed away, will leave the blood more pure and stimulating, and better fitted to give tone and energy to the muscular fibres; hence cleanliness and warmth of the skin, in man and animals, conduces to the vigor and power of the locomotive organs.

Light is another agent that operates upon the energies of the muscular system. It is observed that the deficiency of light produces paleness and feebleness in plants, —so it is with men and animals. Place a man in a dark room, he will have but little strength, and his countenance will wear a pale, sickly hue. It is for this reason, that faintly lighted ground-rooms, used for culinary purposes, and underground dark cells, where convicts are confined, are so prejudicial to the health of their inmates. Rooms, for whatever purpose used, should be well lighted.

The operating agent of the muscles is a fluid supplied by the brain, and transmitted to them through the nerves. This fluid is known to be supplied by, and transmitted from the brain. The prostration of muscular action that exists in disease of this organ (as the apoplexy) and a changed condition of muscular action in intoxication, and the inactive state of the brain in sleep, are illustrations of these principles. Under such circumstances the tonic contraction of the muscles ceases. The same is true when a nerve leading to a part is severed. As the connection between the brain and muscles is so intimate, it is as necessary that the farmer and mechanic

have the brain well developed, active and healthy, as the professional man, or man of letters.

Fig. 11.



"*h* The tibialis anticus; *i*, the extensor longus digitorum; *k*, the peroneus tertius; *l*, the extensor longus, or proprius pollicis; *m*, the extensor digitorum brevis; *n*, the peroneus longus; *o*, the peroneus brevis; *p*, the annular ligament.

"A similar provision is made in the leg for keeping the muscles down to proper places, that has been noticed in the fore-arm. Those bands, called annular ligaments, which encircle the ankle, to prevent the tendons, as they run upon the top of the instep, from flying out from the bones, in a high state of contraction, must excite admiration. This they have a constant tendency to do. If a person is walking up a flight of stairs on his toes, he will then perceive the strong action of the tendons and the reaction of the ligaments upon them. All those animals which climb, as squirrels, monkeys, bears and some others, have the fascia, or limb cases, much thicker, in proportion to the size of the body, than in man. All the tendons of the toes and fingers are bound down to the bones by inelastic bands, in a similar manner. Birds, particularly those that roost, have a beautiful web of ligamentary threads wound round the leg, just above the toes, for restraining the tendons."

It has been observed among men of the same size, that a wide difference exists in their muscular strength and activity. This depends upon the size and number of the nerves, and the size and activity of the brain. Men that have the nerves leading to the muscles, large, with the

brain active, will perform feats of strength and agility, that other men, of the same size, could not effect. Rope dancers, harlequins, and other feat performers, are persons thus constituted. Persons with small muscles, and largely developed nervous system, will sometimes exhibit very great muscular power for a time, but it will not be of long continuance, except the brain is functionary diseased, as in hysteria. Men of large muscles and small nerves can never perform feats of great strength, but they have the power of endurance, and are more capacitated for continued labor. Thus we cannot judge of the ability of a person to make exertions and continuance of them, by there stature alone. Strength, and the power of endurance, are the result of the combination of well developed muscles, large nerves, and a full sized, healthy, and active brain.

In addition to the regular nervous fluid imparted to the muscles, they need the stimulation of mental fluid (if the term may be used). A person that has the stimulus of the mind to impel him, will make exertions with less fatigue than he otherwise would without this incentive. For an illustration, a sportsman will pursue his game miles without fatigue, while his attendant, not having any mental stimulus, would become very weary. Again, let him spend some hours in pursuit of his favorite game without success, a feeling of ennui creeps over him, but while thus fatigued and dispirited, let the favorite game cross the track, his wearied feelings are immediately dissipated, and he presses on for the flying game with renewed vigor and recruited strength. This principle was well illustrated in the defeated and disbanded French army, in their retreat from Russia. When dragging themselves along with hardly strength sufficient to carry their arms, if by chance they saw the Russian bayonets, or heard the roar of the hostile cannon, the almost palsied arm became nerved, and they wielded powerfully their weapons until the foe was repulsed; then there was a relapse to weakness, and prostration followed. It is thus with the invalid when riding for his health,—relate an anecdote, or excite this

mental stimulus by agreeable conversation, and much benefit will accrue from the ride to the debilitated person. So it is in the daily avocations of life: have some incentive to the mind, and the tiresomeness of labor would be greatly diminished. Let an air of cheerfulness ever pervade our every employment, and, like music, "it sweetens toil."

"The advantage of combining harmonious mental excitement with muscular activity, did not escape the sagacity of the late Dr. Armstrong, who thus notices them in his frequently reprinted poem on the Art of Preserving Health, but without giving the philosophical explanation:"

"*In whate'er you sweat,*
Indulge your taste. Some love the manly toil.
The tennis some, and some the graceful dance;
Others, more hardy, range the purple heath
On naked stubble, where, from field to field
The sounding covies urge their lab'ring flight,
Eager amid the rising cloud to pour
The gun's unerring thunder; and there are
Whom still the mead of the green archer charms.
He chooses best whose labor entertains
His vacant fancy most; THE TOIL YOU HATE
FATIGUES YOU SOON, AND SCARCE IMPROVES YOUR LIMBS."

BOOK II.

Contraction, followed by relaxation, is a fundamental law of the muscular system. The necessity of relaxation when a muscle has been called into action, is seen in the example of a boy extending his arm with a book in the hand as a punishment. The boy cannot keep the arm extended but a little time, make what effort he will. It is seen in the restlessness and feverish excitement that is evinced by persons gazing on troops during days of review. The same is noted in going shopping. Such employments call into action the muscles that support the spinal column in an erect position. This languor or uneasiness, is muscular pain. The long continued tension and streching of a muscle enfeebles its action, and eventually destroys its contraction.

Let a person carry a heavy weight in his hands as far as he is able, then lay it down. An attempt to raise it

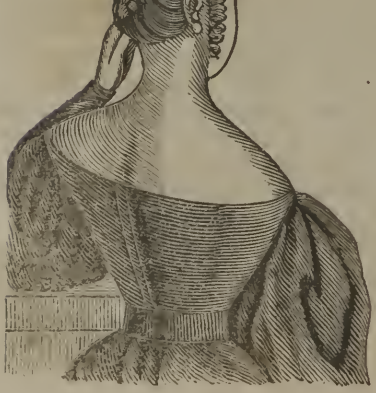
immediately will seem almost impossible. The reason is, that the muscles have lost their tonic contractile power by the continued tension, as is seen in the over-bent bow that has its elasticity destroyed by being over-strained. A similar effect of over distension is also seen in India rubber, if stretched for a time it loose its power of retraction. Exhaustion is the inevitable result of continued tension and muscular contraction. For example, let a lady ply the needle quickly for some hours, the muscles of the back and right arm become exhausted, indicated by a sense of weariness in these organs, a change of employment and position, would call into action a different set of muscles, and this relieves the exhausted organs. Much more labor will be accomplished by taking time to relax the used and exhausted muscles. This is true, also, of the horse and ox; and it is applicable to all kinds of employment. A disregard to the law of the muscles, is attended with weighty consequences. With the invalid, convalescing from fever, relapses result from such a course of action. When a patient is recovering from sickness, his physician should have care that his exercise be proper, neither too much or too little, nor too long continued.

In school, the small children, after sitting a short time, become restless. Change their position, and their imperfectly developed muscles will acquire tone, and again will support the spinal column erect without pain. This compelling the child to sit erect, for a long time, is an evil practice. If it is not immediately noticed, it will develope itself, in after years, in distortions of the spine.

If the air is impure in the school room, the muscles will soon become fatigued. The same is true of work shops, churches, &c. The ventilation of the Exeter Hall, in London, is so arranged, that between four and five thousand persons can be seated for hours, and the air still remain pure. Four hours' sitting in such a hall does not cause so much muscular and mental fatigue, and injury to the system, as two hours' sitting in our common churches, and school houses, where ventilation is not attended to.

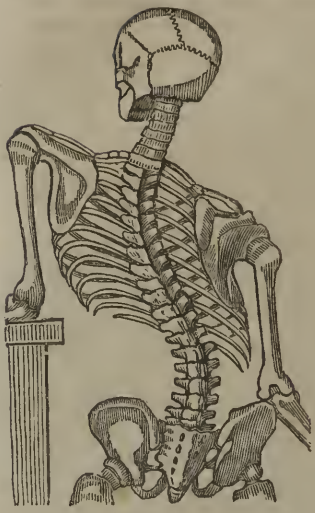
The frequent intermissions, or recesses in schools, are founded on this organic law of the system. The younger and feebler the pupils, the greater the necessity for frequent recesses. I would not have the teacher here think, that one half of her time, at least, should be spent in giving her pupils intermissions, or the mother, that her daughter is going to school to play. But I argue that recesses should be had, and let them be short and frequent, for small and feeble scholars. If such was the practice, the young misses, or daughters, would not complain of weakness in the spine and limbs, and a dislike for school. In sitting, pupils seldom sit erect, but are inclining on the one side or the other. If this habit was broken up by frequent change of position, there would not exist so many deformities. Another influence injurious to muscular action, is, in having the garments so tight, or "snug," as to prevent perfect freedom of action. There are other injurious influences exerted which are prejudicial to the health of the school girl, spoken of in other sections.

Fig. 12.



The annexed is a cut of a fashionable lady, with a genteel deformity. In this case there is curvature of the spine, (see fig. 13.) Such persons have been bred in what is called good society.

When the muscular system has become enfeebled and deformities exist, there is a resort to rachets and corselets, steel and whale bone jackets. But what effect does such apparatus have upon the patient. At first, she can sit erect without effort of a muscular character. Seemingly to the eye of friends, her form is improved; this gives them pleasure. At the end of twelve months, if you remove the supporting apparatus, it will be with difficulty that she can stand, or sit erect. And why? Simply because the first cause of muscular debility is not removed, and it is often much increased. As long as cause is not removed, the effect will continue. The primary cause of the projection of the shoulder blade, seen so frequently among the fashionable ladies, is debility of the muscles of the back, followed by a lateral curvature of the spinal column; which also induces a projection of the anterior part of the chest upon the opposite side. The practical question may be asked, how may such deformities be prevented, and if they exist, how may they be relieved? To the first we will answer, let the girl or boy have a sufficient quantity of nutrient food at regular periods. Let the skin and clothing be kept clean and dry,—have the child wear sufficient clothing that the skin be not chilled, let the dress be loosely worn, have the room where the child sleeps, plays, studies, or works well ventilated; let the muscles be used, alternated with rest, but not a long time without a change of position; and whatever is done by the child, have it done in a cheerful manner; and always when the child sits or stands, have the erect position strictly observed.



This cut represents the condition of the spine, or back bone where projections of the shoulders are seen, or where one shoulder grows out. In these cases there is always a lateral curvature of the spinal column. And usually two curves as seen in the cut.

The ribs or side at the lower part of the chest, hollow in, and on the other side they project,—one hip likewise projects.

Fig. 13.

Such a process is simple, and secures health to the system of the child. The remedy when deformities exist, consists in an observance of the above-mentioned items. In addition, kneading, shampooing, and friction to the muscles that extend up and down the spinal column. Friction and applications, to the scapula do no good. Severe pain and ulceration, must be relieved by applications, directed by the understanding and discreet surgeon. In all cases where mechanical support is called to aid weakened organs, it is only to give support while the system is invigorated by appropriate measures; thus indirectly giving tone to the weakened organs. A common place example will illustrate this. An individual has an injured knee. While walking to keep up the energies of the system, he uses a crutch to take the weight of the body from the bone. Here the crutch indirectly gives tone to the injured member, while the general health is promoted by exercise. But when the limb has regained its health, the use of the crutch would be worse than useless.

In addition to attention to the food, air and exercise, bathing the entire back with the following would be good,

℞ Hops, 4 ounces.
Wormwood 4 ounces.

Steep in eight quarts of water, add salt, one pint, vinegar, two quarts. This apply as hot as can be borne to the back for fifteen minutes, morning and evening. Wipe dry and rub the back downward with the naked hand, thirty minutes, using the following linament.

Camphorated spirit,	4 ounces.	
Olive Oil,	2 ounces.	
Aqua Ammonia,	2 ounces.	
Oil Hemlock,	1 ounce.	Mix.

The medicines directed under the head of Costiveness would be of much utility.

THE BONES.

The bones are the frame work of the system; they give attachment to the muscles and ligaments. To give a clear idea of the relative uses of the bones and muscles, I will quote the comparison of another, though, like other comparisons, there are points of difference. The "bones are to the body, what the masts and spars are to the ship,—they give support, and the power of resistance. And the muscles are to the bones, what the ropes are to the masts and spars. The bones are the levers of the system. By the action of the muscles, their relative positions are changed. As the masts and spars of a vessel must be sufficiently resisting and firm to sustain the action of the ropes, so the bones must possess the same qualities, to sustain the action of the muscles in the human body." We find them characterised by hardness, inflexibility, insensibility, and strength. By means of the bones, the human frame presents to the eye a wonderful piece of mechanism, possessing perfect symmetry of form, uniting with it freedom of motion, andgiving security to life.

Some give security to the organs which they enclose.

Of this number are the bones that form the skull, the sockets of the eye, and the cavity of the nose. Others, in addition to the protection they give to important organs, are useful in movements of certain kinds. Of this class we find the bones of the spinal column and ribs. Others are subservient to motion only; the bones of the upper and lower extremities are of this class. The general form of the bones used in the protection of organs only, is flat; they are likewise thin. Those that combine protection with motion, are more cylindrical, as the ribs. The general form of the bones of the extremities are cylindrical and hollow, with enlargements at each extremity.

In the mechanism of man, the variety of movements he is called to perform, requires a corresponding variety of component parts. The different bones are so admirably fitted to each other, that they admit of all the motion that is required. The skeleton of animals is not always internal, but is sometimes found external with the skin, as the lobster. Some anatomists reckon 260 bones in the system, others but 253. The teeth, and the small accessory bones that are often met in the system, are included in this number,—rejecting these, and computing those that are distinct in infancy, but united in manhood, we find only 197.

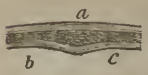
Fig. 14.

This engraving will convey a general idea of the form of the bony skull, and of the manner in which the bones are connected. 1. The bone of the forehead called the frontal. 2. The parietal bone upon the side of the head. 3. The temporal bone. 4. Is the wedged shaped

bone which forms the key stone of the arch of the cranium. 5. The cavity for the protection of the eyes. 6. The holes which aid in the formation of the nostrils. 7. The lower jaw.

These bones are flat, and are composed of two lamina, or plates, united by porous, or cancelated matter. They are dove tailed together, presenting a serrated, or saw like union. We see here the striking provision of the great Architect, in framing the skull of several bones. Had it been one solid bone, the least shock would have affected the whole brain. In the following engraving, the two lamina of the skull bones, are represented with the intervening porous substance.

Fig. 15.



a. The external bone; *b. c.* The internal table, the intervening cellular texture, being spongy and carrying vessels and nerves from one part to another.

The bones of the face are fourteen in number: the two nasal bones, two lachrymal bones, and upper jaw, two malar bones, the two palatine bones, the two turbinated bones, the vomer, and the lower jaw. The last named bone is the only one susceptible of movement. These bones afford protection to the organs of smell and sight, in connection with the skull bones. They also give form to the face, and support to its soft parts.

A FRONT VIEW OF THE SKELETON.

Fig. 16.

HEAD AND NECK.

a, The frontal bone.
b, The parietal bone.
c, The temporal bone.
d, A portion of the sphenoid bone.
e, The nasal bone.
f, The malar, or cheek bone.
g, The superior maxillary, or the upper jaw.
h, The lower jaw.
i, The bones of the neck.

TRUNK.

a, The twelve bones of the back.
b, The five bones of the loins.
c, *d*, The breast bone.
e, *f*, The seven true ribs.
g, *g*, The five false ribs.
h, The rump bone, or sacrum.
i, The hip bones.

UPPER EXTREMITIES.

a, The collar bone.
b, The shoulder blade.
c, The upper arm bone.
d, The radius.
e, The ulna.
f, The carpus, or wrist.
g, The bones of the hand.
h, First row of finger bones.
i, Second row of finger bones.
k, Third row of finger bones.
l, The bones of the thumb.

LOWER EXTREMITIES.

a, The thigh bone.
b, The knee pan.
c, The tibia, or large bone of the leg.
d, The fibula, or small bone of the leg.
e, The heel bone.
f, The bones of the instep.
g, The bones of the foot.
h, The first row of toe bones.
i, The second row of toe bones.
k, The third row of toe bones.

A BACK VIEW OF THE SKELETON.

Fig. 17.

THE HEAD.

c, The parietal bone.
b, The occipital bone.
c, The temporal bone.
d, The cheek bone.
e, The lower jaw bone.

NECK AND TRUNK.

a, The bones of the neck.
b, The bones of the back.
c, The bones of the loins.
d, The hip bone.
e, The sacrum.

UPPER EXTREMITIES.

a, The collar bone.
b, The blade bone.
c, The upper bone of the arm.
d, The radius.
e, The ulna.
f, The bones of the wrist.
g, The bones of the hand.
h, First row of finger bones.
i, Second row of finger bones.
k, Third row of finger bones.
l, The bones of the thumb.

LOWER EXTREMITIES.

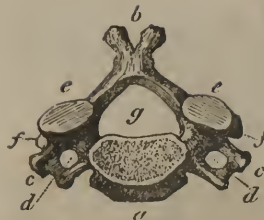
a, The thigh bone.
b, The large bone of the leg.
c, The small bone of the leg.
d, The heel bone
e, The bones of the instep.
f, The bones of the toes.

Fig. 18.

The trunk contains fifty-seven bones. Of these the vertebræ (as the bones of the spinal column are called) number twenty-four. (The word vertebræ signifies to turn.) The upper seven are named the cervical, because they belong to the neck. The next twelve are named the dorsal. The last five are called the lumbar, because they are situated in the loins. On examining one of these bones, we find seven projections, named processes. Four of these, that are employed in binding the bones together, are called articulating. Two of the remaining are called the transverse,—the other the spinous. The last give attachment to the muscles of the back. This column rests upon the sacral bone, which is closely compressed between the bones of the pelvis. The bone at the extremity of the sacrum is called the coccyx, making twenty-six in the spine, or back. The large part of the vertebræ, called the body, is round, and spongy in its texture, like the extremity of the round bones. The processes are of a more dense character,—consequently less easily injured. These joints, or vertebræ, have between them a peculiar substance, of a highly elastic nature. This not only facilitates the bending movements of the back, but this flexible and yielding cushion of cartilage and ligament, serves the important purpose of diffusing and diminishing the shock in walking, or leaping, and tends to the protection of the delicate texture of the brain.

The projections are so arranged, that a tube, or canal, is formed immediately behind the bodies of the vertebræ, in which is placed the medulla spinalis, or spinal marrow, sometimes called the pith of the back bone.

Fig. 19.



"This is an accurate drawing of one of the bones of the spine at the neck; *a*, is the body of the bone; *b*, the spinous process, or handle, which gives the name of spine to the whole column; *c*, *c*, the transverse processes to which the muscles adhere, producing motion; *d*, *d*, round holes through the arms of the bones for safely lodging an artery which carries blood to the brain; *e*, *e*, the upper, *f*, *f*, the under surfaces which make a joint above and below it; *g*, the hole through which the spinal marrow, or pith of the back, passes in safety from the head, through the whole chain of twenty-four vertebræ."

The costa or ribs, are twenty-four in number. For the curious, I would say, that they number alike in both sexes. These are irregularly curved,—the upper ones being much shorter than the middle ones. Their position is inclined, being neither vertical or horizontal, giving dilitation, or expansion, to the chest, when their anterior and moving extremity is elevated. The upper ribs being the shortest, it is an indication that the lower part of the chest should be the largest. Between the sternum or breast bone, and the anterior extremity of the ribs, we find a yielding substance, named cartilage. This conduces to the elasticity of the chest, and free movement of the ribs.

The following engraving, will give you a good idea of the bones of the chest, which is composed of a portion of the spinal column, of the ribs, and sternum or breast bone.

Fig. 20.

b. b. the spine; *a.* sternum or breast bone, *c. c. c. c. c. c.* designate the ribs, the upper ones being more curved and much shorter than the lower ones. The parts between the division of the ribs and the sternum represent the cartilages that join the ribs with the breast bone.

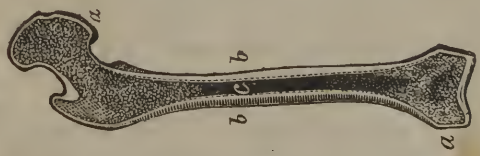
The upper extremities consist of the clavicle or collar bone, the scapula or shoulder bone, the humerus or first bone of the arm, the two bones of the fore-arm, eight bones in the wrist, five in the hand, fourteen in the fingers and thumb, making sixty-four in both arms and hands. The collar bone is attached at one extremity to the sternum, and the other is united to the shoulder bone. If the clavicle is broken, the shoulder will be inclined forward, and in a manner become useless. A fracture of this bone is somewhat troublesome to manage. The scapula is a hard, irregular bone, cushioned upon a considerable mass of muscle, or lean meat. At one corner there is a slight depression, upon which is placed the large round head of the humerus or first bone of the arm. This shallowness favors freedom of motion in every direction, but leaves the bone in a condition to be easily displaced. This is the reason that there are more displacements of this bone, than any other in the system.

Fig. 21.

"In this cut is seen the union of the shoulder blade, or scapula, the collar bone, or clavicle, the sternum or the breast bone, and the shoulder joints. These are detached from the body; hence the view is a front one. A portion of the collar bone of the right side is also seen,—all the others being on the left side. The figures from 1 to 11, indicate the ligaments that keep them united when the muscles are dissected away."

The humerus or first bone of the arm, is long, cylindrical, hollow and enlarged at each extremity. The cells of this hollow are filled with an oily substance, termed marrow. The enlarged extremities, though they present a greater surface, contain no more matter than the central points, but they are more porus or spongy. To these enlarged extremities are attached the tendons of the muscles, and the satin ribbon-like bands, named ligaments, which bind the bones together.

Fig. 22.



The above engraving represents a section of the thigh bone, *a. a.* the extremities having a shell or thin plate of compact texture covering small cells diminishing in size but increasing in number as they approach the articulation, *c.* the cavity that contains the marrow, *b. b.* the walls of the shaft which are very firm and solid. The structure of the bones of the arm is similar to the lower extremities.

The lever, or lower end of this bone, unites with the bones of the fore-arm, to form the hinge-like joint called

the elbow. In the upper ends of the ulna and radius of the fore-arm, and the lower extremity of the humerus, the ligaments that bind the bones together to form the joint, and the terminal tendinous extremity of the muscles, are attached.

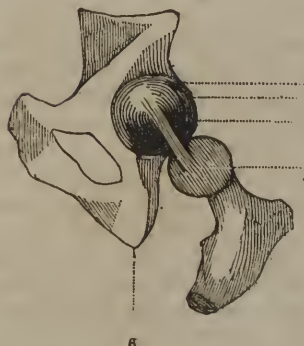
By a very simple arrangement of the radius and ulna, the palm of the hand is turned upward and downward. This is effected by a button-like enlargement of the extremity of one bone, playing in a little groove in the side of the extremity of the other. The one bone has the enlarged head, or extremity, the other has a groove adapted to it. At the other extremity, the button-like head and groove are reversed. The bones thus arranged are bound together by bands, named the coronary ligaments. These bones are acted upon by two sets of muscles, turning the hand different ways; at the lower extremity the two bones are united with eight small bones, called the carpus or wrist. These are firmly bound together, and permit of only a small amount of motion and are difficult of displacement. They are not so frequently "put out" as is often imagined. The diseases that are palmed off for displacement of these bones, are mainly injuries of the connecting ligaments and soft parts, with which the bones are surrounded. In the palm of the hand five bones are found, called the metacarpal. They are small, hollow, round and enlarged at each extremity; one end is united to the carpal bones, while the other extremity gives bases to the phalanges or bones of the fingers. Four of them are bound together at the phalangiel extremity; the other diverges. The fingers are composed of three ranges of bones, the thumb of but two; upon the palm side they are flattened, but rounded upon the opposite. Upon the last joint the nails are placed, which are appendages of the skin.

The lower or pedal extremities are connected with the spinal column, by the ossa innominata or nameless bones, which in the child consists of three pieces, but in youth become united. Within this bone there is a deep depression named the acetabulum, from its supposed resemblance to the cup used by the Romans to measure their vinegar. Into this cup or depression, the head

of the femur or thigh bone is inserted. The two innominata, with the sacrum and coccyx, from the pelvis which supports the bowels. The sacrum is a wedge-shaped bone, concave in front, and convex behind. It is called the sacrum, from the fact that it was offered by the ancients in sacrifice.

The coccyx in infants, consists of several pieces, but in youth it becomes consolidated into one bone. This forms the terminal extremity of the spinal column. The femur or thigh bone, is the largest and heaviest in the system. It is hollow and cylindrical; having many large projections, to which are attached the massive muscles of the thigh. The ball-like head of the lower extremities is firmly bound into the acetabulum cup-like cavity by ligaments.

Fig. 23.



"This is a drawing of the lower part of the hip bone, or innominatum, in which is seen the head of the thigh bone, tied into its socket by a short round cord to keep it always in place. Were it not for this wise provision, a thousand unguarded movements would throw the hip out of joint: *a* is the membrane that covers the joint; *b* the cord that keeps the bones in the socket; *c* the socket in the hip bone; *d* a rim of the socket to deepen it, and *f* head of the thigh bone; 6 the point of bone on which we sit." The movement of this joint is not so free and various as that of the shoulder, but it is stronger and less liable to be thrown out of its socket. The lower end is very large, forming two large tuberosities that are felt very prominent at the knee.

Fig. 24.

Fig. 24 represents a section of the knee joint, *d*, *d*, the extremity of the thigh and leg bone, *c*, the patella or knee pan.

The knee joint is formed mainly by the extremity of the femur, and the large bone of the leg, named the tibia. The joint is hinge-like, having flexion, and extension, and but little lateral motion. This is one of the most important and complex joints of the whole system, it having many connecting bands or ligaments. The patella or knee pan, is a small cone and, like a pulley, plays over the head of the thigh bone. It is connected with the tibia by a strong band or ligament at its lower edge; at its upper edge it gives attachment to the strong terminal attachment of the muscles upon the anterior part of the thigh. The three bones of a peculiar form and situation, together with the many and complicated connecting ligaments, make this one of the most complicated joints in the system. The importance as well as complication of this joint, render its injuries a matter of importance. They should never be tampered with by the unskillful and ignorant; neither should they be neglected by the patient. Early surgical advice should be sought, even if the injury be seemingly slight. Below the knee we find two bones, but unlike those of the fore-arm. In the leg, the tibia is much lar-

ger than the fibula. In form they are triangular, and at each extremity firmly bound together by ligaments. In addition to this, there is a thin membranous ligament running from one bone to the other, the entire length of the bones. The large bone forms the main part of the ankle joint, it being placed upon the connecting bone of the foot. The extremity of the fibula is merely placed upon the side of the astragalus, or connecting bone of the foot.

The tarsus is composed of seven irregular bones, larger and more firmly bound together than the carpus. These bones are placed in a double row, forming an arch of much elasticity. Upon these bones are placed the metatasial bones of the foot. They are curved upward in the centre, increasing the arch of the foot. Upon these are placed the phalanges, or the fourteen bones of the toes. In some respects they resemble the bones of the fingers, with the exception that they are shorter and smaller, nor do they move with so much freedom. This is the result of two causes, viz : the arrangement of the muscles is not so complete, and they are not used so much or as freely, as the fingers. Persons deprived of the use of the hand and fingers, by practice, can accustom the parts to action, so that they will act with great facility. But their employment is always limited.

COMPOSITION OF BONES.

The bones are composed of two principles. The one is called the animal, the other the earthy matter. The animal is composed chiefly of gelatine, or, in other words, jelly. The earthy is principally composed of two salts, viz. : the phosphate and the carbonate of lime. This can be proved by a simple series of experiments. Take the bone of any animal and put it into the fire a short time; on removing it, we shall see the form of the bone preserved. It is much whiter, and can be reduced to a fine powder by a little rubbing. This is owing to the loss or destruction of the gelatine by the action of fire, the carbonate and phosphate of lime remaining. Subject a bone to the action of diluted muriatic

acid for a few days. On removing the bone from the acid, the form will be noticed to be unaltered. But now it may be cut with a knife with ease. It may be bent in any way, with little effort. The acid has united with the carbonate and phosphate of lime, and the muriate of lime has been formed, which is a salt soluble in water the carbonic and phosphoric acids being set at liberty. There is now left the gelatine that preserves the form of the bone; this is soft and yielding. In cases of rickets, there is a deficiency of the salts of lime, and this is the cause of the deformities that attend these diseases of children. It is well known that the bones and limbs of infants are more easily bent, than in advanced age. This is in consequence of the gelatine predominating, and the gelatine alone remains, which preserves the form of the bone. This soft and immature state of the bones in the young child, unfits it to sustain long continued standing in an upright position. The attempt to induce a child to stand or walk, while very young, is unwise, and often productive of injury to the system of the child. The lower limbs being imperfectly developed, there being but a small amount of the earthy salts, they bend when the weight of the body is thrown upon them for any length of time.

The efforts to induce the child to walk, by the use of standing-stools, leading-strings, and other means, create the bow-legs or bandy-legs, as they are called, that we see in the community. The bones that compose the spinal column, and the ribs in the child, are very soft and yielding. Such being the case, the clothing should be loosely applied to the child. A very small amount of pressure upon the gelatinous ribs, will push them in upon the lungs, heart, liver, stomach, and other important internal organs. The bandage or swathe, made use of by some mothers to support the parts about the navel of the child should be abandoned. In ordinary cases, they need no support, and such attempted assistance is sure to be attended with injury. Let all the clothing of the child be loose. The hip bones of the child, like the other bones, are soft and yielding. If the child be carried much upon one arm around the parlor, deformity may be produced. As the child advances in life, the gelatine

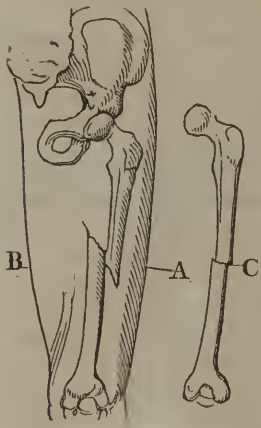
gives place to the earthy matter, which renders the bones firm to resist the action of the more mature muscles, and the forces operating upon them. As the child advances in years, the bones bend less easily, and are fractured more readily. In middle age, the proportion of gelatine, and the carbonate and phosphate of lime, are more nearly balanced. They fracture more readily than in the child. They are at this period of life, firm, elastic, and not so readily injured as in younger years, or more advanced life. In old age they are found to be friable or brittle, and if they are fractured, it will require a greater length of time to unite them, than in middle age ; for the reason that the gelatine is diminished, while the salts of lime have been very much increased.

The health of the bones depends upon a supply of nutrient blood, and proper exercise. As a general thing, we see that, among the active and industrious men, when digestion is good, the lungs healthy and well developed, with an abundant supply of pure air, they have also, well developed and well formed limbs. On the contrary, persons who toil in damp rooms, who sleep in badly ventilated chambers, whose food is poor in quality, and deficient in quantity ; that pursue a laborious and exhausting occupation for many hours continuously, and in unnatural positions, will have their bones more or less diseased. When the system of the child or young animal is developing, attention should be given to their clothing, food, sleeping rooms, and employment. The amount and kind of labor should be adapted to the age, health, and development of the bones. The bending bones of the child, and the brittle bones of the aged man, are not adapted, by their organization, to long continued and hard labor. Neither are the yielding bones of the child fitted for long continued sitting, or standing in one position. If deformities exist, these practices increase them. Every child and every deformed person should have employment, and opportunity to exercise,—but the employment and exercise should always be adapted to the conditions of the patient, and varied frequently. Exercise invites a flow of fluids to the bones of the

body; the bones of those who have the proper amount of exercise are firmer, stronger, more healthy, and less liable to disease, than in the person that is indolent, and has but little exercise. We find the most symmetry of form, and exemption from disease, among the laborious and toiling classes in the community. Thus we see, there is truth in the Latin maxim: "Ubi irritatis, ibi fluxus." When there is irritation, or exercise, there is a o w offluids.

FRACTURED BONES.

Fig. 25.



In this engraving, B. represents the thigh, A. the thigh bone fractured obliquely, the ends of the bone sliding by each other, by the shortening or contraction of the muscles. This always occurs in oblique fractures. C. represents the bone broken transversely. In this species of fracture, there is no shortening of the limb. When the ends of the broken bone are brought together and retain by splints and bandages, it is called the setting of a bone. The method of applying bandages will be explained in another section.

In fractures, the union of the divided bones is effected by a glutinous, gelatinous material, which is separated from the blood by the vessels of the fractured bone. Several days must elapse, before there is sufficient action excited in the blood vessels of the fractured bone, to secrete this agglutinating material. In youth, the union is effected from ten to twenty days; in the aged, a much longer period is demanded. I would here say, that many think that the attention of the surgeon is needed during the first few days after the injury, but when the inflammatory pain and swelling has somewhat abated,

his attendance is deemed unnecessary. "The limb is doing *well*," is the word, and "I will send for you when I need, or want you." In fact, the watchful eye of the surgeon is most called for, while the bones are uniting. This, in the young, is effected from the eighth to the fifteenth day; in the middle age, from the tenth to the twenty-fifth day; in aged persons, from the fifteenth to the fortieth day. The varying health and condition of the system, render the time of union very different in persons. At the period of the bone's uniting, if it be not in place, and straight, the limb will be shortened and crooked. The dressing at this period, should be very nicely applied, if a strong, healthy limb is expected. The material that first unites a fracture, is first gelatinous and soft, it then becomes harder, firmer, and cartilaginous. After this, the parts assume a firm, bony character. The fractured bones after their union, may be bent, until the callus is hardened by the deposition of the salts of lime.

FELONS OR WHITLOW.

In the disease called felon, or whitlow, the matter frequently forms beneath the firm, investing membrane, called the periostium, which surrounds, and is in close contact with the bones of the fingers. In all cases where matter is secreted under this membrane, some days will elapse before it will appear upon the surface of the skin. This membrane being firm and unyielding, the matter causes most agonizing pain, and frequently destroys the bone of the finger. Poultices do but little, if any good, in such cases. The many things used and advised for this malady, are of little avail. Many have suffered days and weeks, trying first one thing, then another, with no benefit. The failure of these things results from the situation, and nature of the disease. If you would alleviate and prevent suffering, save the bone from destruction, and retain the finger, go to the surgeon and have the finger opened freely to the bone. This is the only safe and efficacious treatment. Many wish to wait until the

sore is "ripe," or "fit to open." Let me say it is "ripe" and fit to open, within twenty-four hours after its commencement. Give free exit to the first drop of matter that forms, then apply a poultice.

RICKETS.

In the disease of the bones in children, known by the name of rickets, a softening of the bones, to a greater or less extent exists, from a diminution of the phosphate of lime. In the care of children thus diseased, free exercise in the open air, nutritious food, cleanliness of skin, a proper amount of clothing, good sized, and well ventilated sleeping rooms, would be very sure of effecting a cure. Rickety children being generally confined to that class, among whom due attention to the food, clothing, exercise and air, is not had, medicine to regulate the disordered bowels may be needed.

THE LIGAMENTS.

The ligaments next demand our attention. There is attached to the enlarged extremity of the bones, satin-like bands termed ligaments. These are inelastic, firm, unyielding, and possessing no sensibility, when in health. These parts, like the bones, when not diseased, may be cut, rasped, or burned, and there will be no pain; but when diseased, the pain is severe. In health, the comfort and movement of the person would be restricted if the bones and connecting ligamentous bands were sensible. When these parts become diseased they require a period of repose for reparation, like the bones when fractured. The pain that attends the movement and use of diseased joints, admonish the sufferer to desist from labor that time and favorable conditions, may restore the parts to health. Hence pain and tenderness of the diseased tissues may be considered a blessing. Under these bands, running from the projecting and prominent point of one bone, to that of another, is found a sack-like ligament, called the capsular. This surrounds all the joints.

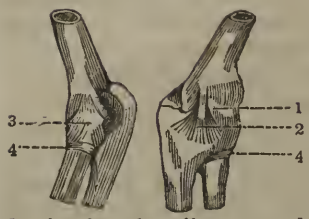
The heads of all the bones are covered by a substance termed a cartilage. It is, in point of hardness, firmness, and elasticity, midway between the bone and muscle. Beneath this is seen the rough extremity of the bone to which it is united. It can be cut easily with a fine edged knife. This cartilage, has drawn over it a very thin, smooth membrane. This membrane is reflected from the cartilage to the capsular ligament, and covers it.

Thus we see that the part last described, and called the synovial membrane, is a closed sack. From this there oozes out, or is secreted, a very soft smooth fluid, that lubricates, or oils the joint. It is to the joint what oil is to the axle of the wheel. In some forms of inflammation of the joint, at the commencement this synovial fluid is diminished in quantity—causing a feeling of roughness about the joint. When the quantity of fluid is increased, as in some stages of inflammation, it is called dropsy of the joints.

Take the joint of a calf, or ox, and examine it. The satin-like bands called ligaments, will be seen running from one bone to the other: under these will be seen the membranous bag called the capsular ligament. This is seen to be very smooth, as it is lined with the soft synovial membrane; beneath this membrane is seen the cartilage, that may be cut with a knife, under the rough extremity of the bone. The joints of these animals, very generally, resemble the joints of man. Hence the examination of these joints may be of profit to the child in the study of human anatomy and physiology. The bones of the upper and lower extremities are so constructed as to permit of free movements, and there is a provision made against the displacement of the bones by the arrangement of strong and firm ligaments.

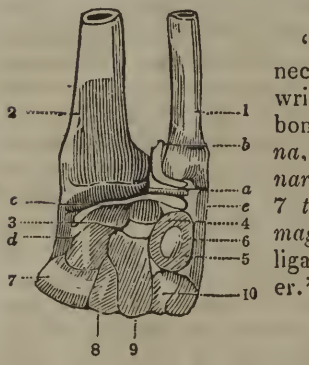
In the dislocation of a joint, some of the ligaments *must* be torn.

Fig. 26.



In this figure we have a view of the short, strong ligaments about the elbow joint. The short ligaments of the elbow are here demonstrated. We see that they are not only short, but they are strong and numerous. The wonder is, that the elbow can be dislocated without entirely destroying the entire ligamentory arrangement. The figures from 1 to 4 not only give the locality, but even the figure.

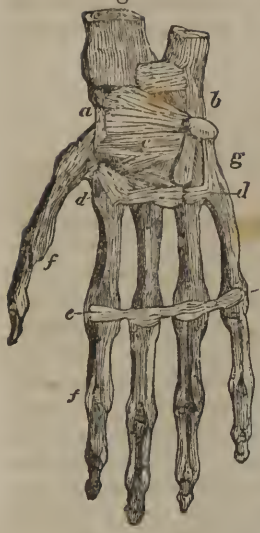
Fig. 27.



"This diagram shows the connection of the little bones of the wrist or *carpus*, with the long bones of the fore-arm. 1 the *ulna*, 2 *radius*, 3 *scaphoides*, 4 *lunare*, 5 *cuneiforme*, 6 *pisiforme*, 7 *trapezium*, 8 *trapeziones*, 9 *magnum*. The letters mark the ligaments that tie them together."

The following figure gives a fine view of the strong ligaments that bind the bones together about the wrist and hand upon the anterior side.

Fig. 28.



"Complex as the ligaments appear in this plan, there is certainly an admirable simplicity conducing exactly to the perfection of the frame of the hand. Each letter shows the place of each ligament as found on dissection, joined to the bones which are thus drawn together like so many wedges. It would be impossible for the most ingenious mechanic to take the dry bones and secure them together by wires, clasps, rivets, or straps, so strongly as nature has done, by means of these little shining ligaments."

Fig. 29.

"By this drawing, which is true to nature, it will be seen distinctly how the bones of the instep and ankle are articulated, how the instep and phalanges, or toe bones, meet; and lastly, the small letters direct the eye to the locality of each ligament which assists in binding this congeries of large and small blocks firmly together like a pavement. In cases of club-foot, the ligaments are very much deranged, in consequence of the distortion and displacement of the bones. But however formidable the case may appear, if seasonable exertion is made, the very worst club-foot may be remedied by an iron shoe provided with metallic rods running up by the side of the ankle so that both apparatus and the bones may be kept in place. With the advice of the surgeon, any

ingenious mechanic can remedy a malformation of the foot, if the trial is commenced while the bones are imperfectly ossified."

DISLOCATIONS.

In all instances of displacement of bones, the ligaments and membranes are severed, as it is not possible to dislocate a joint without injuring the connecting ligaments. Such being the case, if the bone is restored to its natural bed, it requires time for the repair of the severed ligaments. In these cases, as in instances of severe sprains, there will be swelling, pain and tenderness, and other symptoms indicating inflammation. This inflammation must be removed by appropriate treatment; at first the part must be permitted to *rest*. This is absolutely required. At this time, a soothing application, with very mild friction, may be used. To relieve the tension of the vessels, leeches, cupping, cathartics with a low diet, would be beneficial; after the pain, swelling, and tenderness, have somewhat subsided, smart friction with stimulants, as the different kinds of liniment and brandy would be of much benefit. At this stage of the disease, exercise the limb, in order to stimulate the weakened vessels. By this the tone and strength of the limb would be increased. All remedies should be applied at the proper time. The proper time for rest, low diet, gentle aperients, and bathing, is at the commencement of the inflammation attending severe injuries of the joints. The proper time for stimulating washes, liniment, friction, and using the limb, is after the heat, swelling, and tenderness, has somewhat subsided. The treatment that would be beneficial at the latter part of the cure of an injured joint, might destroy the limb if used at an earlier stage.

SPRAINS.

In sprains, the connecting bands, or ligaments of the joints are injured. At the time of the injury, and immediately after, if little pain and inconvenience are experienced, it is regarded as slight, as it is but a sprain.

The person continues to use the parts. The injury of the vessels, with the continued use, soon increase the activity of the circulation. The part becomes tender and painful, and accompanied with inflammation of these dense tissues. As before remarked, the bones, cartilages, and ligaments, have no sensibility, and pressure upon these parts would cause no pain in health. But when injured, pain and suffering follow, admonishing us to cease using the parts.

Treatment.—The management of sprains is a matter of much importance to the community. In all cases the injured part, should be *immediately* freed from exposure. Bathe the limb with warm water, warm vinegar and water, or warm camphorated spirits, and moderate friction may be applied—but *rest* is the sheet-anchor. These are the means to be adopted to prevent the troublesome stiff joints, and white swellings, so often seen in the community.

When a bone is fractured, there is no complaint of sprained limbs. The simple reason of this is, the joints are rested while the fractured bones unite. While the bones are repairing, the injury done them is likewise removed. We learn from this that *rest*, low diet, lotions of camphorated spirits, vinegar and water, are effective means of medication in common cases of slight sprains. The band or rolled bandage, is of much importance in the treatment of sprains, after the heat, swelling and inflammation have subsided, and the joints are in a state which is termed weak.

In all cases of severe sprains, application to a competent surgeon should be early made. The joints being so complex, if severely injured, there is much danger to be apprehended. By taking the advice of competent men, expense and valuable limbs would be saved, and much suffering avoided. Better do thus, than seek the advice of all irresponsible, disinterested advisers, who in reality know nothing of the nature and treatment of such injuries. Natural surgeons are no better than natural watch repairers. Better trust a three dollar

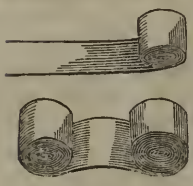
pinchbeck watch with the latter (which no person would do) than the management of a limb with the former.

BANDAGES.

In all families, bandages are applied, when the limbs or joints are injured. When well applied they are of much benefit. When not properly used, they are of no utility, but sometimes do great injury. Every person should know how to prepare and apply a bandage.

A bandage is made of cotton or linen cloth divided into strips, from half an inch to three inches or more in width; old cloth is better for bandages than new, as it is smoother and will not give so much.

Fig. 30.



It should be wound into a small roll, as seen in the upper engraving 30, or into two rolls, by commencing at each end as seen in the lower figure. (The upper one is the most convenient for common use. It is called the *single headed roller*, while the lower one is called the *double headed roller*.

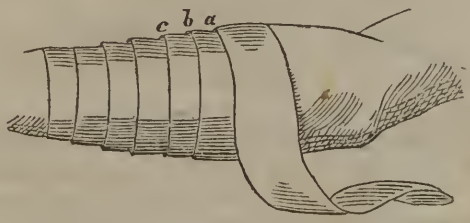
"To roll a bandage with ease, fold the terminal end of the roller five or six times on itself, so as to form a sort of axis or mass; roll this a few times on the thigh to give it size. Then place its two extremities between the thumb and forefinger of the right hand, while the body is allowed to run over the forefinger of the left, where it should be firmly pressed by the thumb of the same hand, so as to make a considerable degree of traction, and tighten the cylinder. Having arranged this, give a rotatory motion to the band, by causing the cylinder to revolve upon its axis by means of the fingers and thumb of the right hand, whilst, at the same time, the left revolves partially around the cylinder itself, which, by this compound movement, is soon formed as required, and as may be well seen in the cut.

Fig. 31.

The *spiral*, is the bandage most frequently employed in the treatment of diseases of the extremities, as well as those of the trunk.

As most of the parts to which it is applied are conical, it follows that, in the ascent from the lower to the upper part of them, especially in the extremities, we must pass from the apex of the cone to its base, and that consequently one edge of the body of the roller will press on the part, while the other will project beyond it, and form what are known under the name of Gaps, as *a*, *b*, *c*. To

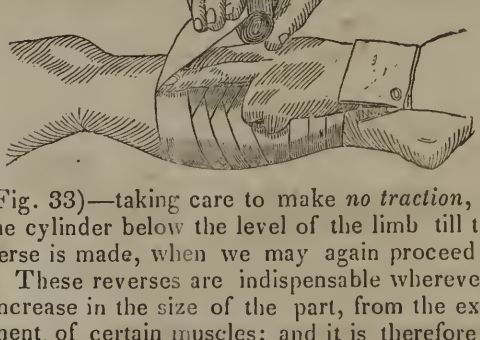
Fig. 32.



obviate this and cause the bandage to apply itself perpendicularly to the whole surface of the part, the roller must be half folded on itself, or a doubling made, which is called a *Reverse*. As the bandage by this action ac-

quires an increased thickness, a greater degree of pressure will be made on these points than at any other, and it is therefore desirable, in order to obviate the bad effects which might result from it, that the reverse should be as short and as smooth as possible. To do this, hold the roller in the position in which it is generally applied, that is, either by its body or its two extremities, the hand being in a state of supination; the fingers of the other hand are then applied to that part of the body of the bandage which is already in contact with the limb, not to assist in forming the reverse, or to fold it down, but simply to prevent its slipping while the reverse is being made. Thus fixed, we should see that no more of the band is unrolled than will enable us to separate the hand a short distance from the limb, say three or four inches; and then *keeping all slack* between the fingers which fix the body of the roller and the part which is in the cylinder, turn the hand holding the cylinder from supination into decided prona-

Fig. 33.



tion (Fig. 33)—taking care to make *no traction*, nor to sink the cylinder below the level of the limb till the fold or reverse is made, when we may again proceed up the limb. These reverses are indispensable wherever there is an increase in the size of the part, from the extra development of certain muscles; and it is therefore of the greatest importance that the proper way of making them should be acquired, as no spiral bandage can proceed four inches on an extremity without requiring a reverse.

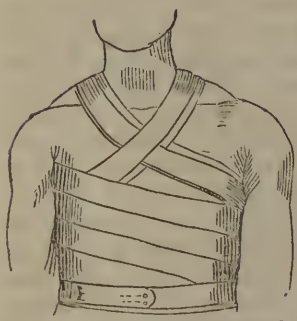
Although generally regarded as the most difficult point in the application of the roller, it is not so in reality, and a little attention to the rules, recollecting always that *no traction is to be made*, nor the cylinder sunk below the limb, or widely separated from it, while the reverse is forming, will enable any one after a little practice to make them with great ease and neatness. To add to the latter, they should, as far as possible, be kept in a perpendicular line, as seen in the cut of the spiral of the lower extremity.

The special applications of the Spiral Bandage are as follows:—

SPIRAL OF THE CHEST.

This is composed of a single-headed roller, ten or twelve yards long, and three or four inches wide.

Fig. 34.



Position of the Patient.—Always sitting up, so that the hand of the surgeon may pass readily behind the back.

Application.—The initial end is applied to the anterior part of one axilla, say the left; and the roller is then conducted upwards across the front of the chest, passes over the right clavicle, and over the back to the point of departure; another and similar turn being effected, it is then carried across the front of the chest to the right axilla, to form an oblique from this to the left clavicle, after which it is carried firmly around the chest in spiral turns from above, downwards.

Use.—In fractures of the ribs, care being taken to apply compresses to their anterior and posterior extremities, if the fragments project inwards; but if outwards, upon the parts themselves.

SPIRAL OF THE ABDOMEN.

Composed of the same parts as the above.

Application.—Commencing at the lower part of the chest, carry the roller spirally round the abdomen from above, downwards.

Use.—To compress the abdomen, in certain cases, as after the operation for tapping in ascites.

SPIRAL OF ALL THE FINGERS, OR GAUNTLET.

Composed of a band, eight yards long and one inch wide, rolled in a cylinder.

Fig. 35.

Application.—Commence the bandage by one or two circulars around the wrist; pass obliquely over the back of the hand, and by oblique turns descend to the nail of the forefinger; then by spiral reversed turns, ascend to its base; pass to the middle finger; descend by oblique turns to its nail; ascend by spirals to its base, and so on, till all the fingers are covered in, terminating at the base of the little finger, then pass in front or on the back of the hand to finish by circulars around the wrist.

Use.—We may resort to this bandage when more than one finger is injured, and there is reason to fear their uniting if they are permitted to come in contact, as in cases of burns.

SPIRAL OF THE UPPER EXTREMITIES.

Composed of a roller, eight yards long, two or two

and a half inches wide and compresses if it is required as a compressing bandage.

Application.—Having covered in the fingers if necessary by the gauntlet, commence with one or two circular turns around the wrist, in order to fix the end of the bandage, then pass obliquely over the back of the hand and palm, to reach the extremities of the fingers, ascend by three spiral turns without reversing, which brings us to the phalangeo-metacarpal joint of the thumb; cover this and the wrist-joint by a figure of 8, as will be described hereafter, and ascend the limb by spiral and reversed turns, till we reach the elbow; cover this also by a figure of 8, if the arm is to be flexed, if not, by simple spiral turns without reverses, and continue the spiral and reverses to the shoulder, placing compresses, &c., where they may be required.

Fig. 36.

Use.—To cover in, support, and compress the whole limb, as in varicose veins, aneurismal tumors, treatment of fractures, &c.

Position of the Patient.—Sitting or lying down, with arm and forearm extended, and the palm of the hand looking forwards, the thumb being widely separated from the hand.

The effects of this bandage, when well applied, are excellent; but it may become very fatiguing and painful if drawn tight, and if *too* tight, may produce gangrenous ulcers of the skin. In 1837 it was found necessary in the Pennsylvania Hospital to amputate the forearm of a

man who had had only a simple fracture of the lower extremity of the radius, but whose arm was grangrenous from the mal-application of this bandage by a country surgeon.

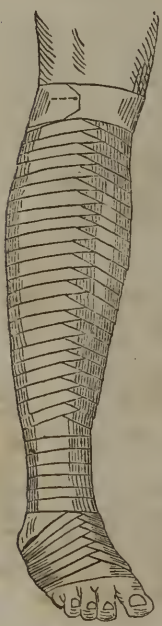
The spiral of the thigh, of the leg, of the foot, and of the toes, are similar to the above, and may therefore, be included in the

SPIRAL OF THE LOWER EXTREMITY.

Composed of two simple rollers, each eight yards long and two and a half inches wide.

Position of the Patient.—If possible, seated with the extremity of his heel on the very point of the surgeon's knee, or else lying down, and the leg supported by assistants. The surgeon may be either at the foot, or on the *outside* of the limb, and either sitting or standing.

Fig. 37.



Uses.—This bandage, if well applied, fulfils every indication either in the treatment of fractures, ulcers, varicose veins, or œdema, and will usually keep its place, if the patient remains in bed, for two or three days. The main difficulty in its application consists in the covering in of the heel. This is not absolutely necessary, as the close adhesion of the integuments to the parts below, prevents any great amount of swelling; but where a considerable degree of compression is made on the leg, it is a better plan to cover in the heel entirely. To do this, proceed from the inside of the instep of the right foot under the heel to its outside, then around its point to the inside, forming a cap for the heel, round under the sole of the heel up across the instep, to go round the point to the opposite side and come up over the out-side of the ankle, then over the instep, under the sole, up over the ankle in front, over the inter-

nal malleolus, round to the external, and then up the limb.

Application.—Commence by making one or two circular turns, immediately above the malleoli, to fix the end of the roller, then descend, if in the right foot, from the external malleolus obliquely across the instep and under the sole to the extremity of the little toe; from this make two or three oblique turns which will cover in the foot as far as the instep, and then cover in the heel by turns of the figure of 8, one extremity of the eight embracing the heel and ankle, the other the instep; after which, ascend the limb by spiral reversed turns, which may be made with either hand, until you reach the knee. Cover in this joint by a figure of 8, and proceed with the second roller to make spiral reversed turns on the thigh, till the whole is covered in.

BANDAGE OF THE INSTEP.

Composed of a single-headed roller, seven yards long and *two inches* wide.

Application.—Lay the initial extremity of the roller on the tarsal end of the metacarpal bone of the little toe, if in the right foot, on that of the big toe, if in the left. Hence pass obliquely over the front of the foot to the

Fig. 38.

first joint of the big toe in the right foot, or to that of the little toe if in the other. Then go under the sole of the foot horizontally in a line with the metacarpo-phalangial

articulation, to the outer or inner side of the foot, according as it is the right or left. From this point make two obliques over the front of the foot, which will bring us to the instep on its inner or outer side, and then pass directly to the point of the heel in a line parallel with the sole of the foot, the edge of the roller projecting a little beneath the sole, thence around the heel to come to the instep again, keeping still parallel with the sole of the foot, cross the instep and make another turn similar to the first, which shall embrace the heel and instep cover in one-third of the preceding turn, and form a spica on the instep. Continue these turns, gradually ascending, till the foot will hold no more, when we may terminate the bandage by circulars above the ankle, or else form a spiral up the limb.

Use.—This forms a most excellent bandage for cases requiring firm compression of the instep or ankle, as in wounds of the anterior or posterior tibial arteries at these points, and is at the same time exceedingly neat in its appearance: the figure also shows the proper position of the limb of the patient and of the surgeon.

MANY TAILED BANDAGE.

Fig. 39

In some instances it is convenient to apply the many tailed bandage. It is composed of several strips from one to two inches wide. These are arranged so that the edge of one strip overlaps another. Then they are slightly tacked together.

Application.--The end of one strip is brought obliquely over the limb, then the other extremity is drawn obliquely over this as seen in the upper strip in Fig. 39. All the strips are applied in a similar manner as seen in the engraving. The ends of the last one are pinned or tacked together.

Use.—This is a good bandage when one is demanded and the limbs cannot be moved in removing the dressing.

LACED OR BUCKLED BANDAGES,

Are so named from the manner in which they are confined to the part: as they are usually obtained from the glovers and others, I shall only refer to them in passing.

LACED BANDAGE FOR THE KNEE.

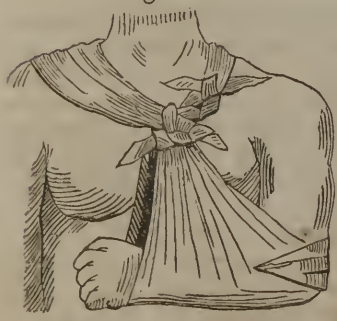
Fig. 40.

This is made of an elastic tissue, as buckskin or kid, which is lined with India-rubber, and laces at the side, as seen in the drawing. It is sometimes employed where constant compression is required, as after dislocations of the patella.

A laced bandage may be made for the ankle joint, or the whole of the lower limb. In case of weakness of the limb or joints of injuries, they are invaluable. They will make more equal compression and retain their place better than a bandage, and are therefore superior, when it is necessary to use a bandage for a long time.

SLING FOR THE ARM.

Fig. 41.



Application.—Place one handkerchief in a cravat around the neck, and knot its ends over the sternum. Place the other in a triangle under the forearm, so that its base may be next the wrist, then tie its angles to the cravat, and carry the summit around the elbow to fasten to the body of the triangle in front.

Use.—To support the forearm. This method of forming the sling is better than the common way, as the knots do not cut the back of the neck, owing to the position of the cravat, whilst the summit, being fixed at the elbow, keeps the arm more closely to the side of the body.

DIGESTIVE ORGANS.

THE mammalia, which constitutes the highest order of organic development in the animal kingdom embraces, as the term signifies, all such animals as rear their young, —as the human species, the monkey tribe, the whale, and various species of domestic animals. Here men and animals are provided with a complication of organs, all of which are more or less subservient to the process of digestion. Without this process, the functions, or offices of the other organs, could not long be sustained. As it is from the chyle the blood is formed, if the digestive powers should be suspended, this milk-like fluid would cease to be elaborated, and no blood would be formed. The functions of the heart and arteries being suppressed, the brain would cease to act, and life become extinct. The same is true of the digestive organs, if the heart discontinued its action. Thus it would appear, that the functions of all the organs are performed in a circle, the one being dependant on the other ; and, like a circular chain, break one link, and it remains useless until repaired.

To understand the structure and office of these organs, it is necessary to explain each one individually, and then collectively. The organs to be examined first, are those by the action of which the food is converted into a fluid, which is taken up by the absorbent vessels of the intestines and introduced into the circulation. In these organs the knowledge and wisdom of the Great Designer are manifested.

They are divided by descriptive anatomists into several parts. I will first call your attention to the mouth. Here we find in the upper part and roof of the mouth the palate ; in the upper and lower jaw the teeth are in-

serted for masticating or chewing food; within this cavity, is placed the tongue. Under it, and within the lower jaw, are large glandular bodies, in which is secreted, or separated from the blood, a peculiar fluid, named the saliva, or spittle. Behind the angle of the lower jaw, and below the ear, is a body, similar in character and structure. The one behind the jaw, is the body that enlarges in mumps—the one below the jaw forms what is called the kernel, when enlarged from colds,—the one under the tongue, when it enlarges, forms the disease termed a "frog." All these glands open into the mouth, and their peculiar secretion is conveyed there.

The following engraving gives a fine representation of these salivary glands.

Fig. 42.

1, indicates the parotic gland. 3. the duct leading from it, an opening into the mouth at 5. 4 represents the buccinator muscle. 6 the submaxilary gland under and within the jaw. 10. the sublingual gland placed under the tongue, which is marked 11.

At the back part of the mouth we find what is called by anatomists the pharynx. This is the mouth-like commencement of the opening, called the œsophagus or gullet, which opens at the root of the tongue.

The œsophagus is a muscular tube that lies behind the trachea or wind pipe, being in contact with the bones of the spine in the neck and chest. This tube passes through the diaphragm, or midriff, and communicates

with the stomach at its upper and left extremity. This opening is named the cardia, or the cardiac orifice of the stomach. Through this tube, the food, after being masticated or chewed, is passed into the stomach. The stomach and liver, are placed immediately below the diaphragm and in contact with it. This muscular membrane separates these organs from the lungs and heart, that are placed in the chest. The liver is found on the right side of the system, the stomach upon the left. These organs, respectively, extend but a trifle beyond a line dividing the system into two halves, which dividing line, is called the median. The form of the stomach is curved, somewhat resembling a Scotch bag-pipe, to which it has been compared. At the left extremity of the stomach and attached to it, is an organ, called the milt or spleen. The use of this organ is not well understood. At the right, and smallest extremity of the stomach, is found an opening, named the pylorus, or pyloric orifice of the stomach. This communicates with the upper part of the intestines.

The following engraving will give a good idea of the situation of the liver, stomach, spleen, pancreas, and upper part of the small intestines.

Fig. 43.

i represents the gall cyst placed upon the under surface of the liver; *h* the cardial orifice of the stomach, *c* the duodenum or upper portion of the intestines, *d*. the pancreas, *f*, the spleen.

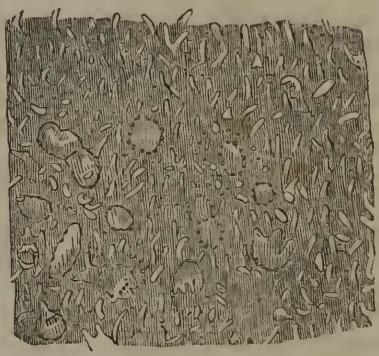
In this engraving, the under surface of the liver and stomach are represented. The œsophagus is composed of two coats or membranes, the internal, or mucous coat, with which the food comes in contact, and the muscular coat, which is composed of two coats of muscular fibres, the one longitudinal, the other circular. It is by the action of this coat, that food and drink are swallowed. The stomach is composed of three coats, or layers. The external coat is called the serous membrane, the middle coat the muscular membrane, the inner coat the mucous membrane. In order, to have it better understood, I will compare it to an article of food with which most are acquainted. Take the portion of the ox, called the tripe. One side appears smooth and glistening. From this side there can be stripped off a thin semi-transparent membrane. This, like the external coat of the eye in man, contains no blood vessels that can be seen, while in a state of health. Under this serous, or peritoneal coat, if the tripe be boiled, there will be found a thick membrane, that composes the main body of the article. This will be seen to be composed of fibres, or strings, like lean meat, or muscles. These fibres run in two directions, some around and some lengthwise, and it is called the muscular coat. In the human stomach, the fibres of the middle or muscular coat, are of a similar character but not as large. The thread-like fibres, are also, seen running in different directions. It is by the action of this coat, that the stomach contracts upon the food, in the process of digestion. By this contractile energy, the food, after it has undergone its appropriate change, passes out of the stomach through the pylorus.

The internal surface of the tripe presents a variable appearance. In some parts it appears in folds, or plaits ; in others it has the appearance of cells, not unlike the honey-comb. This is called the mucous coat, or mucous membrane, which comes in contact with the food. An innumerable number of blood vessels and nerves are found scattered over the surface of this membrane. There are also many little glands, and

follicles, in which is separated from the blood the peculiar mucous that sheaths, or covers the parts, when in health.

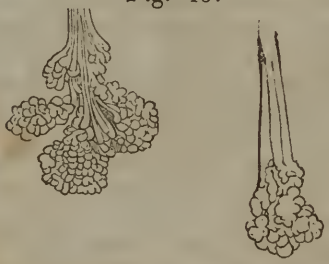
The following engraving is a representation of the small glands of the intestines, that lie under the mucous or internal coat. They are represented highly magnified. The villi are also displayed.

Fig. 44.



The internal, or mucous coat of the human stomach presents nearly the same rugose or fold-like appearance as the intestines, it also abounds with myriads of small bodies, called glands, in which is secreted from the blood the gastric juice, a solvent so powerful in some animals as to dissolve stones and metals.

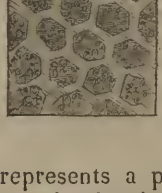
Fig. 45.



The above engraving represents glands upon the

coats of the stomach, from which the gastric juice is secreted. They are magnified 45 diameter.

Fig. 46.



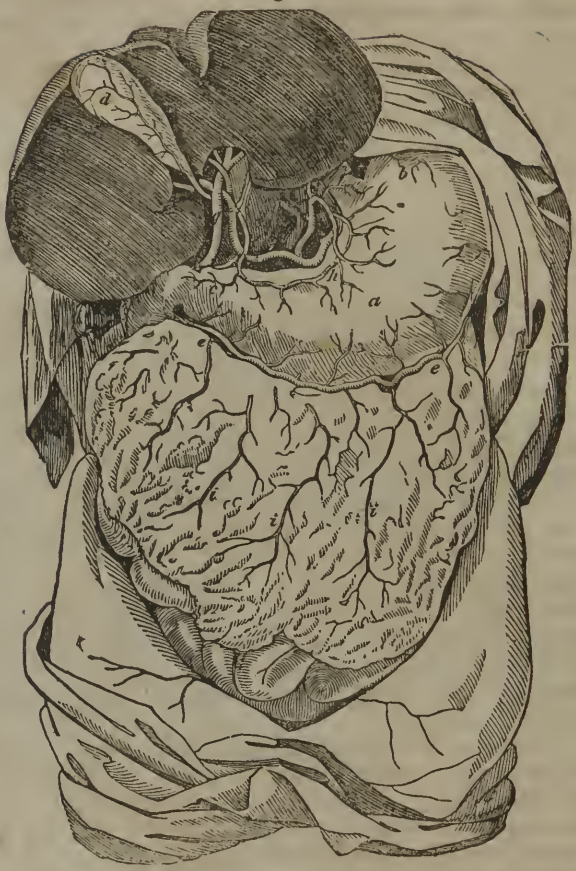
The above cut represents a portion of the mucous membrane of the stomach, showing the entrances of the secreting tubes or cells upon its surface.

The *omentum*, or *caul*, consists of two membranes, loaded with more or less of fat, lying between the membranous lamina. This membrane is attached to the largest and anterior curvature of the stomach, and falls in front of the intestines, in a curtain-like manner. The liver, the largest gland in the system, is placed in contact with the diaphragm, extending a little to the left of a line dividing the system into two equal parts. It is convex upon its upper surface, and concave upon the lower. This gland has a cyst upon the under surface, called the gall bladder; the appearance of this organ corresponds to that of the domestic animals. In this organ the bile is secreted.

Passing transversely across the abdominal cavity, under and below the stomach, lies the *pancreas*, which is called the sweetbread. In this organ a milk-like fluid, in appearance, is secreted from the blood; this, with the *bile* secreted in the liver, enters the upper portion of the intestines, called the duodenum, about five inches below the stomach.

The intestines, or bowels, are divided into two grand divisions, viz. the large and small. The large intestines are divided into three parts, viz. the cæcum, or blind portion, the colon, and rectum. The cæcum, is a small worm-like process, attached to the head of the colon. The

Fig. 47.

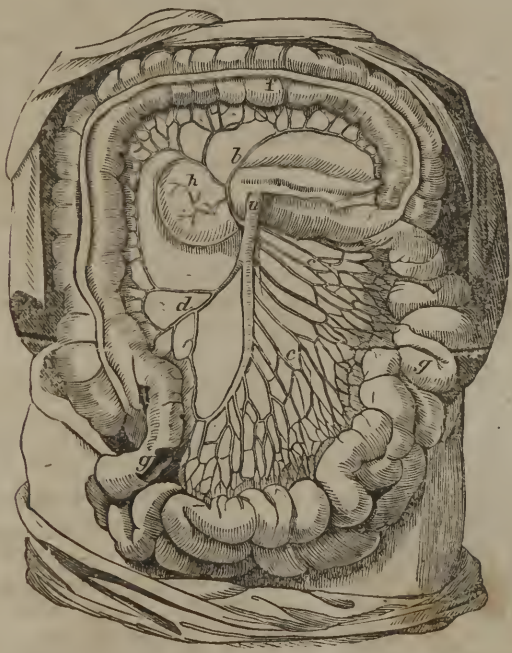


"In this view of the abdomen, *d*, is the gall-bladder, lying on the under side of the liver, the dark mass to which it is attached; *h*, is the *coronary* artery, which supplies the stomach, *a*, *b*, *c*, with blood. The curve of the stomach is well shown. *e*, *e*, the arteries which supply the caul marked *i*, *i*, which falls down from the front of the stomach, over the intestines, like an apron; *g*, a vessel of the liver. The *pancreas* is behind the stomach."

head of the colon, called the caput, commences upon the inside of the right haunch bone, ascends on the right side

as far as the liver. Under this organ it turns and crosses the system under the liver and stomach, and reaches the spleen, where it again turns and descends, and finally dips into the pelvic cavity or basin, situated in the lower part of the abdomen. The portion upon the right side, is called the ascending colon. The portion below the stomach and liver, the transverse colon. The portion upon the left side, the descending colon. The part in the pelvic basin, is called the rectum. In man, as in the domestic animal, the hog, the colon is thrown into sacks, or pouches.

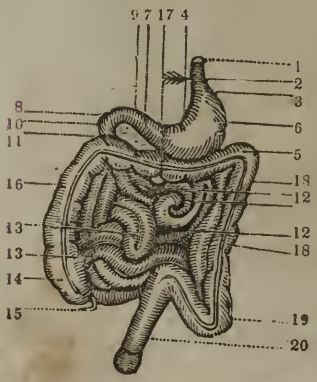
Fig. 48.



In the above engraving the ascending colon commencing on the right side, with the transverse colon, *f*, is represented with the pouches *g*, *g*, represents a portion of the small intestine, *a*, *b*, *c*, *e*, *d*, *h*, represents the superior mesenteric artery and branches

The small intestines are divided into the duodenum, jejunum, and ilium. The duodenum constitutes the first twelve inches. It commences at the pyloric orifice of the stomach, passes down to the right about five inches under the liver, and in contact with it. It then crosses to the left side, behind a mass of the small intestines, the transverse part of the colon and omentum. The remaining portion of the small intestines, the jejunum and ilium, are loosely attached to the parts about the spine. The whole tract of the intestines, is about thirty feet in length. The coats of the intestines are three in number, as in the stomach, and similarly arranged. The internal surface has many folds, called the valvulæ conniventes. This makes this coat more extensive than either the other two. In addition to the great number of blood vessels and nerves supplied to these parts, there is another set of vessels called the lacteals, or lymphatics of the intestines. These vessels open into the intestines upon the mucous membrane. They are exceedingly small and very numerous, and pass through a set of glands named the mesenteric, and are collected into one vessel, named the thoracic duct. This vessel is of the size of a common goose quill, and passes up the chest, behind the heart, and opens into the large vein at the lower part of the neck.

Fig. 49.



"1, The œsophagus, or swallow perforating.

2, The left opening of the diaphragm.

3, The cardiac orifice of the stomach.

4, The small curvature of the stomach.

5, The great curvature of the stomach.

6, The fundus of the stomach.

7, The pylorie orifiee.

8 ,The duodenum, divided into three portions.

9, The ascending,

10, The transverse, and

11, The descending, portion.

12, The jejunum, forming three fifths of the small intestines, distinguished from the ilium in being thicker, more vascular, larger, and having more valves.

13, The ilum, forming less than two fifths of the small intestines, and terminating in the cæcum, having two valves at the entrance.
14, The cæcum, the first of the large intestines, situated in the right, having attached to it
15, The appendix vermiformis. The cæcum terminating in
16, The ascending portion of the colon, which directs its course from the cæcum towards the stomach, connected to the right kidney by a fold of the peritonæum.
17, The arch of the colon, traversing the abdomen beneath the stomach.
18, The descending portion of the colon, directing its course towards the left region, connected to the left kidney by a fold of the peritonæum.
19, The sigmoid flexure of the colon, situated in the left iliac region, and terminating in
20, The rectum."

The nutriment that passes into the system, is subjected to the action of the stomach and intestines. All solid food taken into the mouth, is, or should be reduced to a fine state by the action of the teeth upon it, and, by being well masticated, it has mixed and incorporated with a great amount of fluid from the glands about the mouth. This fluid is named saliva or spittle, which moistens the food, that it may pass with ease through the œsophagus into the stomach. When there is a proper amount of saliva mixed with the food, it stimulates the glands of the stomach, causing them to throw out a powerful solvent, called the gastric juice. By the action of this fluid, and the contractile muscular energy of the stomach, the food of different materials of the animal and vegetable kind, is changed into a homogeneous mass, named chyme. The chyme is passed through the pylorus into the duodenum, or the upper part of the bowels. Here the chyme excites an action in the coats of the duodenum, in the liver and pancreas. These organs are called into action, and they secrete bile and pancreatic juice in considerable quantities. These fluids unite with the chyme and change it into a fluid, of a milk-like appearance, named chyle. The fluid of the food of a nutrient character, with the residual matter is moved along the intestinal tract over the mucous membrane by the action of the muscular coat. This movement, is called peristaltic or vermicular, from its resemblance to the movements of a worm in crawling. As the chyle passes along the intestines, the open mouths of the lacteals, suck it up and transfer it to the thoracic duct, through which it passes to be mixed with the blood. The residual matter by the peristaltic movement of the bowels is carried

out of the system as an excretive in the daily alvine evacuations.

In the change that the food undergoes in the stomach, the bile has no agency. In a healthy state of this organ no bile is found there, and the common belief that the stomach has a redundancy of bile in it, is erroneous. The expression so common, that a person is bilious, is not ordinarily correct; if bile is brought up in vomiting, it merely shows that not only is the action of the stomach inverted, but also that of the upper part of the bowels. In some very severe cases of Hernia and obstruction of the bowels, the alvine feculent matter is ejected by the long continued and severe vomiting.

It is a law of the system that each organ is excited to the most healthy and efficient action, when called into action by its own appropriate stimulus. This being the case, we find the glands about the mouth responding to the stimulus of the nutrient food that is adapted to the wants of the system. The wants of the system do not require tobacco, and its stimulation to the glands of the mouth causes disease, not only in them, but in other organs of the system. Spirits, wine, tea and coffee, are not natural excitants of the stomach, the wants of the system do not demand their stimulation, and the tendency of their use is to induce disease in the stomach. The chyme formed in the stomach is adapted to the healthy stimulation of the duodenum, liver, and pancreas. The chyle is the natural stimulating excitant of the lacteal vessels. Each stage of the digestive process must be properly effected, in order to have the digestive organs in a healthy efficient state.

Again, every organ of the system will act for a time with healthy energy, and then rest is needed, to recruit its exhausted powers. The arm can be used for a few hours without pain, then the fibres of the muscles become exhausted, from loss of nervous stimulus. A little time for rest will restore the exhausted fibres. The eye will become wearied, and there may be dimness of vision, induced by looking steadily at an object for a time, but calling to assistance "nature's kind restorer," the unpleasant sensations are dispelled.

The glands of the mouth will act with vigor, and secrete saliva in abundant quantity, and then they require time to repair their energies. So with the stomach; it will act upon an adequate amount of food, but like the other organs of the system when called into action, rest is demanded at proper intervals.

In order that the health of the digestive organs be maintained, certain conditions must be observed. To these we now invite attention. *The first condition is, that the food should be taken at regular and stated periods.* The frequency of taking food will be modified by the age, the health, the exercise, and the habits of the individuals. Whatever may be the time adopted, the stated period should be duly regarded. The digestive process is always more rapid in the young and active, than in the aged and indolent; therefore food should be more frequently taken; still *regularity* should be observed. In some young and vigorous persons the food may be digested in one hour, in other persons it may require four hours or more; and in most instances, from three to four hours will be required to digest ordinary meals. In *all* instances the stomach will require from one to three hours to recruit its exhausted powers, after the labor of digesting a meal, before it will again enter upon the vigorous and healthful performance of its functions. If food be taken before the stomach has regained its tone by repose, the secretion of gastric juice and the contraction of the muscular fibres will be alike imperfect. And again, if food be taken, before the digestion of the preceding meal is completed, the result will be still worse, because the already engaged solvent is acting upon the first meal, and the one subsequently taken will remain until supplied with the gastric fluid. The interval between each meal should be long enough to have the whole quantity digested, and sufficient repose given to the laboring organs.

If this principle be true, the adage taught the person convalescing from fever, and the dyspeptic, "eat a little at a time, and eat often," is unsound in principle, and injurious in practice, as the stomach would have no pe-

riod of repose. Persons following this adage and those addicted to irregular habits of eating, and taking a "bite" at any time when convenient, between the regular meal times, complain of a "faint, sickening" feeling at the stomach. The sensation is somewhat like that experienced when by undue labor the muscles have been overtasked. These "morsels" of food are frequently taken to relieve this disagreeable sensation; for the moment it is seemingly efficacious, but like the narcotic alcohol, the relief is only for the moment, and the remedy still farther weakens and prostrates the organs.

By this practice a redness of the tongue is produced, and a dryness of the mouth and throat, and a tenderness in the region of the stomach. This is illustrated in the instance of weak eyes that are subjected to a strong light. The vessels soon become filled with blood, or extremely red; this is the result of using the weakened eyes too long; the same is true of the stomach. Persons whose digestive organs are thus relaxed should at first take a small quantity of food that is easily digested; such as milk, fish, ripe fruit, the unbolted wheat bread, that has been baked twenty-four hours. Then let there be ample time for the food to digest, and for repose of the organs, before another supply is given. The feebler the person and the stomach, the more important to observe this rule. In the feeding and nursing of infants, as well as older children, it should always be regarded. The person who has been confined by an exhausting sickness, should most scrupulously regard this rule if he would recruit his strength and flesh with rapidity.

What amount of food should be taken? This depends upon two circumstances: 1st. The amount of growth, if there be any. 2d. The amount of the waste of the system. To these two circumstances it should be graduated. The lad that is growing fast, not only needs food to repair the waste of the system, but material to promote the growth of the muscles and bones. Hence we notice in the healthy lad, the frequent call for food, the keen appetite, and the vigorous digestion. In every department of nature, waste, or a loss of substance, is

attendant on action. The great toe of the bronze statue of St. Peter, at Rome, has been reduced in size one half by the kissing of the Romanist devotees. Thus, even kissing is attended with waste. The lad who is active requires more nourishment than one of indolent habits. And when the system is matured, there is less demand for food, as only a quantity sufficient for the renewal of the system is required. The individual who has accustomed himself to active avocations, and on leaving them to pursue those of an opposite character, as the learning of a sedentary trade, or attending school, requires less nutriment, as the waste of the system is diminished, in the same proportion as the exercise. If the same quantity of food is taken after the exercise is diminished as before, there will be induced a repletion of the system. Students should guard themselves against this evil, the first few weeks of commencing school. So should girls who leave the active household labor, for the sedentary labor of sewing in the shop of the dress-maker.

Should the food be taken dry, and well masticated, or should it have the assistance of tea or coffee to prepare it for the stomach? If the use of tea and other beverages be proper, then the glands about the mouth that secrete saliva, are unnecessary. The saliva is a natural and healthful stimulus to the stomach, when united with the nutrient food. If other fluids are substituted, the stomach will want this stimulus: and the glands themselves being left in an inactive state, lose their tone as well as the stomach. The one suffers from inaction, the other from the irritating effects of an uncalled for fluid, and deficiency of the natural stimulus. If reason would guide man, as instinct guides animals, in relation to the manner of taking fluids with the food, and the quantity likewise, one great cause of dyspepsia would be removed. The horse is never known to leave his provender to obtain water to wash it down, or the ox, to wash down his blade of herbage. But many persons from habit, rather than thirst, drink largely during meals. This causes distension and enfeebles the contraction of

the stomach; it not only induces a diseased state of the stomach, but causes an unpleasant sense of feeling. While the washing down of food is productive of evil, a moderate amount of drink after eating is useful in the digestion of the food.

The kind of food. Should it contain only nutrient matter, or should it have mixed with it innutritious matter? Experience has shown that the unbolted wheat bread, or "Graham bread," as it is called, is better adapted to the stomach than the flour bread; for this organ, like some others in the system, besides the stimulus of the blood, nervous fluid, and food, needs the stimulus of distension to a certain extent. Aliment that has a certain amount of innutritious matter united with it, answers this indication. The simple articles of diet, seem peculiarly adapted to distend this distensible organ. These articles are the nutrient fruits, vegetables, milk, bread, and the different kinds of animal food, in moderate quantities, during the cool season of the year. During the warm season, abstinence from animal food would be productive of comfort and health. If milk and flesh be taken as articles of diet, they should be of a healthy character. No fluid secreted in a disordered animal is healthy and fit for an article of diet. The same is true of the flesh of animals; if they are diseased, the flesh is unfit for food. Animals, as well as men, have the natural functions of their organs deranged when the exercise, food, and air is unnatural, and not adapted to the constitution of the creature. Confine sheep in a close, bad air, without exercise, and they die of the rot. Cows kept in stables are tuberculous. On the same principle, stall-fed cattle and sheep, deprived of customary exercise and air, become diseased. The forcing feeding process of domestic animals is unnatural, and tends to cause disease, as a similar process would in man. If an animal not accustomed to exercise for some weeks, be driven several miles to market, the driving will cause a deranged state of the animal's system, rendering it unfit for food. The milk of cows deprived of exercise, air, and natural food, is of an impure character, and unfit

for diet. For reasons named above, all stall-fed meat is unfit for food. Highly seasoned food is not adapted to the condition of the digestive organs. It usually contains too much nutriment in too small bulk ; it excites the mucous membrane too much, and stimulates the stomach by distension too little. Hence persons feeding upon such articles, become more or less diseased.

The proper state of the organ of the system, when the food is taken, is of much practical value. It appears to be a law of the system, that two important set of organs cannot be called into intense action at the same time, without injury to the system, for the reason that all the organs of the system when in action demand the stimulus of an increased amount of blood and nervous fluid. To supply this increased quantity, there is a demand made upon the other organs of the system. The digestive organs are then excited to action, by inviting the fluids from other parts of the system, thus leaving the unused organ deficient in the natural amount of fluids, during the performance of such labor. Some length of time must elapse, before the action of the system is equalized, and until this equilibrium is restored, they are unfitted for an extra amount of action. If the limbs of a person have been violently exercised, it incapa-citates him for vigorous mental application, because the vessels of the used active muscles, are in a state of increased action. The brain consequently, will not have a supply of blood.

If the brain and stomach are called into action at the same time, as in the digestion of food and severe mental study, both organs will suffer, as they cannot be duly stimulated by blood. So of the muscular system and stomach, or the muscular system and brain. Individuals repeatedly calling into action two sets of organs at the same time, to a greater or less extent, become diseased.

Feed two dogs, upon similar articles of food, let one lie down quiet, the other be sent in pursuit of game. At the expiration of one hour, have them killed. The stomach of the one that had remained quiet, will be nearly or quite empty, while the food in the other will be

found nearly unaltered. In the one dog, the energies of the system have been concentrated upon the stomach, in the other they have been exhausted on the organs of motion. So it is with man, if his mind or muscles act intensely after eating, the stomach will not be stimulated sufficiently to change the food in a suitable period. If retained in the stomach an unusual length of time, it becomes irritated. And this is one fruitful cause of dyspepsia, among persons of all classes. A period of inaction is called for immediately after eating, and again when a person has been intensely engaged in any mental or muscular effort, the stomach should not be called immediately into intense action, to digest a full meal, for the reason it is in a state of comparative feebleness and inactivity.

It is no uncommon occurrence, that laboring men, after eating a hearty meal at night, awake with colic pain. In such instances, the brain becomes dormant and does not impart the requisite amount of nervous fluid. From this we may learn the deleterious effects of eating, immediately before retiring for the night. The nervous stimulus being defective, the food remains an irritating substance, causing disturbed sleep and unpleasant dreams. The practical rule would be, not to eat any thing for two or three hours before retiring. Here I will insert a Latin maxim in regard to health :

"Ex magna cæna,
Stomacho fit maxima pæna
Ut sis nocte levis,
Fit tibi cæna brevis."

English,

"To be easy all night,
Let your supper be light,
Or else you'll complain
Of a stomach in pain."

The health and vigor of the stomach, and associated organs, require well developed and healthy lungs. The frequent stomach complaints, among those that have narrow chests, sustain this position. The blood of the system demands that the lungs be adequate to pu-

rify it. If they are not, indigestion will be the result. Pure air is essential to a keen appetite, and vigorous digestion. If it be impure, the waste of the system, viz: carbonic acid gas, is not separated from the blood—under such circumstances the system will not receive pure blood, as its wants demand. The blood thus vitiated is not fitted to sustain the tone of the organs employed in the digestion of food.

During the sitting of the committee appointed by the British Parliament, to inquire into the effects of the manufacturing employment upon the physical system, among other persons examined, one stated that some years before, he had ventilated his mill on a well devised plan, which he had removed at a subsequent period. On being asked the reason for removing the ventilating apparatus, he replied, he noticed after the mill was ventilated, that his men consumed a greater quantity of food; and rather than incur an extra expense for beef, he caused the ventilating apparatus to be taken out. From this testimony, we learn the reason why those persons who sleep in small ill ventilated rooms, who breathe an impure air, have little or no appetite in the morning when they first rise, and why the mouth and throat are so dry and filthy. The blood, under such circumstances, is sent to the organs impure, and they are not stimulated as their nature demands.

Inspiration, independent of its effects in purifying the blood, exerts an important influence upon the abdominal organs. At each full act of inspiration, the central portion of the diaphragm is depressed from one to two inches. This depression is accompanied by a relaxation of the anterior abdominal muscles. At each act of expiration the same set of muscles contract, the ribs are depressed, the diaphragm relaxes, and its central parts ascend. This movement of the midriff causes the elevation and depression of the stomach, liver, &c., at each act of respiration. This gives to the abdominal viscera, the stimulus of exercise. It is noted of individuals, who restrain the free movements of the abdominal muscles by tight dresses, that the tone and vigor of the digestive organs

are impaired. The restricted waist will not admit of a full, and deep inspiration ; and so essential is this to health, that the abuse of it soon destroys, or enfeebles the functions of the system.

Fig. 51. Fig. 50.

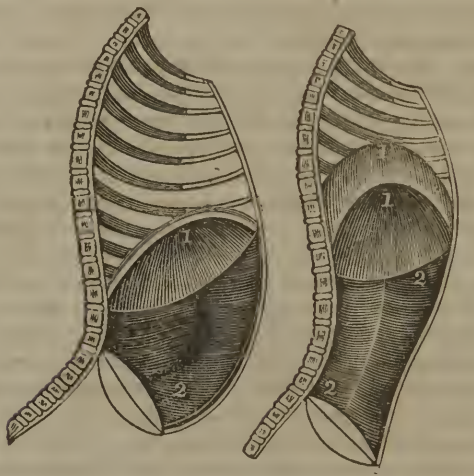


Fig. 50, represents the antero posterior section of the thorax or chest, when the lungs are contracted. .

Fig. 51, represents the antero posterior section of the chest when the lungs are inflated. 1, 1. The diaphram in Fig. 50. 2, 2. the muscular walls of abdomen. Fig. 51. 1, the diaphragm. 2. the muscular walls of the abdomen. In these two figures the diaphragm is seen to be more convex into the cavity of the chest, and the walls of the abdomen flatten when the lungs are contracted than when they are inflated.

The position of a person, standing or sitting, exerts an influence upon these organs. If a person lean or stoop, the distance between the pelvic bones and stomach is diminished. The depression of the diaphragm is prevented, and the stomach, liver, pancreas, and other abdominal organs are pressed upon. The deficiency of the movements of these organs, joined with unnatural pressure, induces many severe diseases of the parts. When we see that healthy and well developed muscles keep the spinal column in an erect position, and that

this position subserves to the health of the digestive organs, should not the child be taught to avoid all positions but the erect, while studying, or walking? This position, combined with unrestricted waists, will do much to remove the now prevalent disease, dyspepsia.

The health of the digestive organs require the muscular system to be duly exercised. If this condition is wanting, the appetite will fail, and digestion will become impaired. As action produces waste, material to repair this loss of substance is demanded. When muscular action is increased, the appetite is more acute, the motion of the stomach is more energetic, and the amount of chyle being increased, a fuller, deeper, and more complete respiration to purify it, is necessary. Thus we see, that exercise and pure air are a sovereign specific for impure blood, want of appetite, feebleness of the system and the digestive organs. The goad to the famished ox, will induce the animal to make a few convulsive efforts, that still farther depress the wearied and prostrated system. But nourishment and moderate exercise will add to the real energies of the animal. Let persons thus enfeebled, attempt to relieve their sinking powers by *drudging* alone, with stimulants and highly seasoned food, the excitement and hope like the convulsive struggle of the animal, will be fleeting. The excitement will be followed by a corresponding depression. There is no royal road to health, unless the organic laws are understood, and practiced.

GENERAL SUGGESTION TO FAMILIES AND MOTHERS.

All individuals, when sick, are naturally inclined to resort to something that will give relief; hence, domestic medication *is*, and always *will be*, practised by parents, to a greater or less extent. It is desirable then, that safe and suitable remedies should be known by those that direct the home treatment. When an individual employs a physician, four things he desires of him: 1st. That he will cure him speedily. 2d. That the treatment employed be not only effective, but safe. 3d.

That he will direct as little medicine as possible to effect the desired object. 4th. That no experiments be tried. To effect these four things, the following conditions are necessary : 1st. That the medical adviser seek out the causes of the disease, and, if possible, remove, or destroy their influence. 2d. He should know how much the system will do to effect its restoration, *what* assistance, and *how much* it needs ; or, in the words of Thomas Jefferson, the medical adviser " should learn the limits of his art." To carry out this, a knowledge of the causes of disease is demanded ; the effects and operation of medicine ; and also when the disease can be safely trusted to the united efforts of nature, and when these efforts should be assisted. Except a physician has such knowledge, he must, and does experiment. An understanding physician has a knowledge of the healthy structure and functions of the system, as well as the diseased action.

To decide whether there is a displacement of a bone, a knowledge of its natural position is requisite ; without which no comparison could be made. For a lady to treat the little ills of her family with propriety, some information is necessary. She should learn the cause of the disease. To illustrate this, suppose a boy should have diarrhea. This may be produced by eating apples, or cherries, or it may be produced by a chill upon the skin. If the former be the cause of the complaint, an emetic and cathartic to remove the indigestible matter would be demanded. In the latter, the warm or vapor bath is demanded. Here we see that effective and safe medication demands an inquiry into the cause of the complaint. After the mother has made the inquiry, and learned the cause of the disease, she should know the effects of the means used to relieve the system, as the bath, or the emetic ; and this knowledge should be definite. If a physician should give an emetic, or other medicines, and be asked what operation the medicine was expected to produce, should he answer, I do not know, I have not thought of that matter, but I *expect* and hope it will cure you. Such a physician would be call-

ed an *experimenter*, and would be dismissed as a dangerous man. So it is with the mother. She should know the effects of her teas upon the system.

After the cause is removed, the physician should decide the question, if the powers of the system demand any aid, by way of medication. So it should be with the mother. In no case should the parent give the "innocent" and "harmless" teas, if the system will relieve itself without such assistance. The different effects of the same medicine, in different quantities, upon the system, should be understood by the physician. For instance, Laudanum, if given in small quantities, is a stimulant, like brandy; if given in a large quantity, it is a sedative and will produce rest and sleep. So it is with the mother's thoroughwort, and other herb teas. Different effects result from different quantities being given. Thoroughwort tea given in very small quantity, would be a stimulant and tonic. If given in a large quantity, it will act as an emetic and cathartic. The different effect being the result of the different quantity. So of all the domestic herb teas, as well as the medicine from the hand of the physician.

The state of the system and diseased organs, will modify the effects of medicine. At one time a small amount of camomile tea would be retained upon the stomach; at another, the same amount would induce vomiting. This is the result of the varying condition of the stomach. Medicine given, or recommended by any lady, be it called a "a harmless" tea, or any thing else, without knowing the cause of the disease, is an "*experiment.*" Medicine directed without knowing the diseased condition of the system, is an "experiment." If it is given or directed, not knowing the effects of the article, it is also an "experiment." The simple and valuable article bread, would, at one time, and in one condition of the system, nourish and give strength; at another, the same would cause pain and suffering. So with brandy; a given quantity can be taken at one time without intoxication; the same quantity taken at another, would produce drunkenness. In some painful diseases of the system when the suffering

is very severe, a large dose of opium might be given with safety; the same quantity given when free from pain, and life would be destroyed. This is also true of all domestic teas, and medicines. The saying of many a kind and benevolent mother, that "if it does no good it will do no harm," "it is perfectly safe," "it is quite innocent," "I advise you to try it," "without trying it you don't know how much good it will do," "it is far better to take it than to have the doctor trying *experiments*," for "they kill more than they cure," exhibit a false principle of action. It is the process of experimenting. The ladies are all against the physician's experimenting, and it is just that they should be. On the other hand should not *they* avoid the same steps? This spirit of monopolizing experiments, is not kind on the part of the ladies. It is anti-republican. Medicine given by the physician, or lady of any kind, and in any quantity, not knowing the proper conditions, as before named, is an uncalled-for experiment. Very much injury is often done by the lady guest from the best of motives. The mother should never give one iota of medicine, without knowing the cause of the disease, the state of the system, and the definite effects of such medicine.

The medication of the lady and mother should be based upon two things: 1st. It should always be *safe*. 2d. It should be not only *safe*, but *effective*. These two things should be kept in mind. The directions of the mother, as well as the physician, should be adapted to relieve *manifest symptoms*, and not imaginary names. Labelling a disease with a certain name, and then giving medicine for a disease so named, is "dangerous quackery."

FOOD IN ACUTE DISEASES.

The most important matter in the management of acute diseases, is the food. In all diseases of the lungs, bowels, and general fever of the system, refrain from giving food. Under such circumstances, it is not digested. It will not promote the growth, nor repair the waste of the system, except it pass through the changes

described in the section on the digestion of food. In sickness, no food should be given to the adult, or child, however young, unless it be digested. If not digested in the stomach, it will pass into the intestines as an irritating and foreign body. Thus food taken in diarrhea, is always injurious. Bonaparte, when indisposed in the least degree, would frequently abstain from food, for several days. Many a kind mother gives food to her offspring when ill, fearing if she does not, its feeble system will suffer from an inadequate supply of that which should give it life. But her fears are ill grounded.

The lacteal vessels of the intestines are inactive when food is withdrawn, and the absorbents scattered over the system are called into activity. They remove the fat, and other parts, an atom at a time, and convey it into the veins. It is then carried into the lungs, and changed into blood. It is in this way, the system is sustained in fever, diarrhea, &c. The removal of the fat for this end, is the cause of the sunken eye, the hollow cheek, and the emaciated limbs. In a word, it may be said an individual feeds upon himself. In this, is manifest the wisdom of Him who, when he created man, placed in his system these vessels which would sustain him, when no food could be taken.

ACUTE DIARRHEA.

This disease is an affection of the small intestines. It is attended with discharges from the bowels of a watery character, and with increased frequency, accompanied with pain, weakness, and thirst. It may be caused by indigestible food, as green apples, or a chill upon the skin. The *cause* is the first inquiry.

Treatment. If there is indigestible food in the stomach, an emetic or cathartic is called for. If there is a chill upon the skin, with dryness, the sweat, the warm bath, or the vapor bath, will be demanded. Ipecacuanha makes a good emetic, and castor oil a good cathartic. The baths, or sweats, will induce a flow of fluids to the skin. Warm stimulating liniments to the bowels, would

be good. A large ginger, or mustard poultice, to the bowels, would be beneficial.

In addition, follow the direction given in the section on food in acute diseases. This is an important item.

CHRONIC DIARRHEA.

This like the acute form, is a disease of the small intestines.

Treatment.—In this attention to the skin by means of bathing, friction, liniaments and mustard, plaster would be invaluable. The food should be nutritious, unstimulating, easy to be digested, and taken at regular periods. The following medicine would be found of service.

℞	Gum Opium pulv.	grs. v.
	Acetate of Lead.	grs. xxx.
	Rad Ipecac.	grs. vi.
	Mix.	"

Divide into twenty pills. Take one ounce in eight hours.

The following would be good.

℞	Tinct. Kino.	
	Tinct. Opii.	
	Tinct. Cinnamon.	
	Mix.	

Take thirty drops at a time, once in five hours. In all cases of Diarrhea, take but little drink.

If the above simple treatment does not remove the affection, employ the family physician, instead of an irresponsible neighbor.

In the above simple description, I include the diarrheas, termed *mucus*, *bilious*, *lienterich*. These divisions, are of no practical use. They are distinctions that are "over nice."

DYSENTERY.

Dysentery is a disease of the large intestines. It is attended with bloody, slimy discharges, voided with

great pain; there is tenderness of the bowels, a dry, hot skin, and thirst, want of appetite and strength.

Treatment. Abstain from taking food, excite an action upon the skin, as in the disease of the small intestines. The drinks should be given in small quantities. Apply a mustard, or ginger poultice, to the bowels,—have the room well ventilated and *quiet*. Give a small portion of rhubarb and soda, or castor oil and sweet oil, in equal parts. After the bathing of the skin, and the oil or rhubarb, has acted upon the bowels, a few drops of laudanum or paregoric, in peppermint herb tea, may be given. Injections of starch are of service. There may be added to them, a few drops of laudanum. The bathing and friction to the skin, the oil to the bowels, the poultice, and the abstaining from food, are usually adequate to control the disease. Should they not do it, send for the understanding physician immediately, as this is a most formidable complaint in some instances. When diarrhea and dysentery are epidemic and severe, flannel worn next to the skin, even in warm weather, is excellent to prevent the disease. In the hot climate of India, those who wear flannel are less prone to contract dysentery than those who dress in linen.

If the disease continues a long time, and becomes *chronic*, the treatment is similar to that of chronic Diarrhea.

COLIC.

Colic is another affection of the bowels, of a painful character. This disease is not attended with increased discharges, as the two last named diseases, but the reverse obtains. There is an obstinate constipation, or costiveness. At the first, there are griping pains, with no tenderness of the bowels. If the disease continues a little time, the bowels will become tender and swollen, and indicate a state of inflammation. This disease may be produced by indigestible food, cold drinks, taken when the system is warm, or by chills upon the skin, as the bowels and skin have a very intimate, sympathetic connection.

Treatment. This should be adapted to the cause of the disease, and the existing symptoms. If there is indigestible food in the stomach, give an emetic of ipecac. If the skin is dry, cold, and contracted, apply friction, a thorough sweat, or the warm and vapor bath. In all cases where sweating or bathing is used, always wipe the skin dry. For internal medicine, give castor oil, united with it from ten to fifty drops of laudanum, in some warm peppermint tea. Give stimulating injections, and apply large poultices, made of ginger, over the bowels. Give drink in very small quantities, and no food. Apply these means, and the disease will usually yield. In place of the oil, senna and manna may be given, or a decoction of thoroughwort, and epsom salts.

VOMITING.

Vomiting is another affection treated, in its primary stage, by the mother and nurse. In this disease, the cause should be ascertained with certainty. Vomiting may be caused by disease of the brain, by chills, or by indigestible food.

Treatment. If food is the irritating substance, remove it by an emetic of a mild unirritating character. The action of the skin should be increased by warm friction, the warm or vapor bath. After the bath, use a good supply of clothing to the limbs and body. An active mustard poultice should be applied over the region of the stomach, and this should be kept on until the vessels of the skin are filled with blood, evinced by a redness of the skin. All food, and irritating drinks and medicine, should be withheld. A solution of gum arabic in water, from a tea to a table spoonful at a time, will be an appropriate drink. Cool pure air, and a quiet room, are of special importance.

The practice of giving large quantities of stimulating teas and drinks, is hurtful and injurious, because it increases the irritation of the stomach. The vessels of the stomach, in cases of vomiting, are excited, and distended with blood, as the blood vessels of the eye are,

when it is inflamed,—and as the stimulant makes the eye worse, so it does the same to the stomach. It is true some ladies assert, that *hot* teas are *cooling*, as did a worthy matron of Massachusetts, who when asked by the attending physician what she had given her husband, replied, only a bowl of some *good cooling tea*, made of "hops, summer savory and saffron." The medication of vomiting, by our matrons, is too stimulating, too irritating, too much of an experiment. Usually making a bad matter worse. An understanding physician will act upon the skin, and will let the stomach rest; he will give mild drinks in very small quantity, as barley water, or gum water. If he gives medicine, it will be only anodynes in small quantities. Should the treatment above detailed not arrest the vomiting in a few hours, send for a physician, as there may be inflammation of the stomach, or brain. A case of this kind cannot be decided by an ignoramus, or quack, as it is an affection demanding the decision of the intelligent and well educated man.

CHOLERA MORBUS.

Cholera Morbus is a disease in which there is both vomiting and purging. This deranged condition of the bowels, occurs in the warm months of the year. The attack is usually sudden, the patient is awaked from sleep, or suddenly alarmed during the day by extreme nausia. Sometimes pain and a sense of lassitude, ushers in the attack. The matter ejected may be the remains of food, bilious matter mixed with mucus, or a peculiar half watery discharge, compared to the washings of fresh meat. Spasms of the abdomen and extremities frequently attend this disease. The combination of these symptoms, rapidly exhausts the strength, and vital powers.

Treatment.—It should be treated by abstinence from food; take drinks in very small quantities, apply warm fomentations to the bowels, warm blankets and warm dry friction to the extremities. Anodynes, as laudanum, or paregoric, given in peppermint tea, would be good. Have

the room kept quiet, and the air pure. After any disease of the bowels has been checked, and the person seems quite well, care should he taken that no food be eaten that will not digest easily. It should be given in small quantities, and at regular periods. The mucous membrane of the stomach, or bowels that have been diseased, is weakened, and easily irritated. The skin should be kept warm by porous clothing, and bathed each morning, rubbing dry with a crash towel, until it produces a glow of heat and redness upon the skin. A chill upon the skin may drive the blood to the weakened bowels, and a relapse will consequently follow such exposure.

LIVER COMPLAINT AND DYSPEPSIA.

In the affection called liver complaint, dyspepsia, &c., persons usually have some coat upon the tongue; it may be red at the edges, and sometimes smooth. They have also sourness, and flatulence, or wind in the stomach, tenderness at the pit of the stomach, or epigastric region, rigidity of the muscles of the abdomen. Sometimes the muscles are relaxed; there is costiveness sometimes, alternating with diarrhea; there may be shortness of breath, and cough, fulness about the head, and headache, pain and weakness of the back. This state of the internal organs, and these symptoms, are attended with a sallow, pale, dry skin, often covered with branny scales, cold feet and limbs. The question may arise, can this disease be prevented, and if it exists, can it be removed? It can be prevented, by attending to the directions given in the sections upon the skin, muscles, digestive organs, lungs, and brain.

Read the sections upon bathing, clothing, exercise of the muscles, breathing pure air, and excessive use of the brain.

Treatment.—To remove the complaint, it is necessary to attend to the same conditions assiduously, as to prevent it, not omitting the observance of them a single day; adapting the amount of clothing, food, and exercise,

to the strength and powers of the weakened organs of the system. As there is costiveness, and a confined, inactive state of the bowels, a judicious combination of tonics, stimulants, and aperient medicines, would assist the powers of the weakened organs of the system in removing the disease. Take quassia, 1 ounce, peppermint herb, 1-2 an ounce, epsom salts 1-2 an ounce. Steep in one pint of water. Of this, take a dessert spoonful before eating. In some instances, the mild preparation of iron would be good, united with mild aperients, and anodynes. This can be used with propriety, under the advice of the understanding physician. All can prevent disease without medical advice, but all cannot rid themselves of the same, without the advice of the educated medical man.

CONSTIPATION OR COSTIVENESS.

Constipation, or costiveness, is a disease exceedingly prevalent among the American people, particularly the ladies. It is a disease that induces other complaints, as the last described disease of the liver, stomach, headache, &c. Hæmorrhoids, or piles, is another serious complaint, caused by the inactive and costive state of the bowels. This disease often alternates with diarrhea. Sometimes a costive and diarrheal state of the bowels co-exist. In such affections, the alvine matter accumulates in the large intestines, and oftentimes this accumulation is very great. When voided, it is dry and hard, like small balls, hence it has received the name of scybala, which is a source of much irritation to the intestinal canal. The prevention of this disease is a great and important desideratum in the community. It is of equal importance, if not paramount with a knowledge of the method of cure. The rules for the prevention of this disease, are given in the sections upon bathing, clothing, exercise of the muscles, the structure and uses of the stomach, intestines and lungs.

Treatment.—To effect a cure of this complaint, it is first necessary to remove the causes, whatever they may

be. If there is an insufficiency of exercise, obviate it by taking a greater amount. If it is the diet, a change should be made in the article of food taken. If the habits of attending to the evacuation of the bowels, the ablution and clothing of the skin, the ventilation of the workshop, or sleeping room, have not been proper, correct them, as described in the section on the skin, muscles, and lungs. In addition, the enfeebled organs may require assistance. To do this understandingly, the condition of the diseased parts should be inquired into. The retained matter being dry, indicates that the fluids separated from the blood, are not thrown out in quantities sufficient to render it soft and soluble, to be voided with ease. Again, the retention of the alvine matter, indicates that the tone of the muscular fibres of the intestines has been diminished and that they are wanting in contractile energy, which has been destroyed by over-distention. Thus it is seen that medicines and means are necessary to restore the secretion, and impart tonic contractile power to the weakened and released parts.

Kneading and shampooning the bowels, as advised and practiced by Halsted, will be found highly beneficial as they excite an action in them. Laxative food is another means. Efforts to have the evacuation at regular periods, is of great importance, and the child should be learned from the earliest infancy, to note this rule, as we are beings of habit. If medicine is resorted to, it should be of such a character that it will excite a flow of fluids to soften the retained fecal matter, and at the same time, increase the peristaltic motion of the bowels, so as to render them capable of unloading themselves. Tonics alone, would be inefficient, as they would only act upon the muscular fibres, inducing contraction, by giving tone to the parts. They do but little, and this little indirectly, to excite an action of the secreting glands. The same is true of stimulants. If cathartics are resorted to, the glands of the intestines are momentarily excited to an unnatural action, and the relief obtained is not lasting. The parts have been excited only, and not strengthened, rum will excite the system of the drunkard to action, but

it does not give permanent strength. The system is always made weaker by alcohol, so are the parts involved in costiveness left weakened by the cathartic, and the disease is only increased. The parts need steady and mild stimulation, that the tone and strength may be permanently increased. In the treatment of this affection, clothing, ablution, feed, and exercise, should be similar as that of other chronic affection of the intestines.

Whatever medicines are used, they should be given in small quantities, that nature may perform her work, with as little assistance as possible. Most of the pills recommended by the papers, leave the bowels weakened and more confined than before. A judicious combination of medicine, would be the following: Thoroughwort, (or eupatorium perfoliatum,) 1 ounce; peppermint herb, 1-2 ounce; epsom salts, 1-2 ounce. Steep in one pint of water. Take of this, two tea spoons-full at a time, once in six hours. Continue it for several weeks, using the other means suggested. At night a pill may be taken of the following: Prussiat of iron, 1 drachm; extract of conium malculatum, 20 grains; rhubarb root, pulverised, 1-2 drachm; Ipecac root, pulverised, six grains, oil of peppermint, 8 drops; mix it together, and divide it into 30 pills. The simple medicine named above, aided by due observance of the air, exercise, food, &c., with the addition of injections of cold water, if pursued from three to six months, will cure, or greatly benefit all cases of costiveness.

In costiveness, liver complaints, and in hæmorrhoids or piles, the use of a spino abdominal supporter would be of more service than medicine. Most cases can be cured by their use. Read the section on the mechanical treatment of chronic disease.

HÆMORRHOIDS OR PILES.

This disease is painful and debilitating, and after it has once been produced, it is very easily reproduced, if there has been a cure of it. It consists of a swelling of some of the small veins, that surround the lower part of

the intestines, or rectum. These swelled veins form tumors, that sometimes present themselves externally; the affection is then called the open piles. In other instances they are just within the verge of the rectum, the disease is then called the internal, or blind piles. If the tumors bleed, then they are called the bleeding piles. Many things may cause this disease. It is very rare that a case of piles is found, that has not been, or is not attended with costiveness, or this, alternating with diarrheal discharges. And so universal does this cause operate to induce the piles, that it may be said with propriety, to be the cause of the hæmorrhoids, and that costiveness is the disease to be prevented, to prevent the piles; as costive, or loaded bowels, make a pressure upon the veins of the rectum. These veins being pressed upon, enlarge, as the veins of the arm do when a tape is drawn around them in bleeding. Being kept full, their coats yield, and small tumors protrude. The veins of the arm will not diminish in size, until the pressure of the ligature is removed. So with the veins in piles, they will not decrease, until the costiveness is removed. The method of relief, or cure, is partially described in the section upon the liver complaint and costiveness. In addition to the means of preventing this affection, the avoidance of cathartics, as the patent pills and bitters, should be sedulously observed. All articles which would irritate and inflame these vessels, should not be taken.

Besides the means recommended in the section on constipation, the chewing of small bits of rhubarb, of the size of a pea, several times each day, swallowing the spittle, and dissolving a piece of alum in the mouth, of about the same size, and taken in the same manner, would be beneficial. For an outward application, an ointment, of an anodyne and astringent character, would be beneficial. The following would be good: fresh lard, 1 ounce; pulverised nut galls, 2 drachms; opium, pulverised, 1 drachm. Mix them well together; apply this to the tumors, three or four times each day. By these means relief is always obtained, and in many cases a radi-

cal cure. In no case will the medicine be of much avail, if the condition named in the section on costiveness, be not observed. The medicine advised should be put up, and taken under the direction of a well-informed, common sense physician. This will be prudent, as one person will require one quantity, and others a different amount, to produce the same result. The other observances can be reduced to practice by all.

HERNIA OR RUPTURE.

The disease termed *hernia*, rupture, and sometimes breach, is exceedingly common, and confined mostly to males. Probably one-fifth, or one-eighth of the laboring men suffer from this infirmity. Many females and children are afflicted with this complaint. It is often concealed ; a feeling existing in the community that it is a disgrace. This concealment often leads to much suffering, and not unfrequently death. This disease is often called colic, stoppage, or inflammation of the bowels, &c. Ignorance of the nature of the disease, and its concealment, prevent the proper means from being duly applied, as it is at the commencement that applications are the most efficacious. The situation and size of hernia, vary in different persons, and in the two sexes. The tumor is from the size of a filbert to that of an orange, and the opening through which the tumor passes, may be of the size of a crow quill, or it may be an inch in diameter. The small openings, and the small hernia, are the most dangerous, because they become confined, or strangulated, the most frequently and readily. Hernia may occur in a child of two days old, and it may be produced in a man or woman of sixty.

The tumor, in some instances, is composed of the omentum, or caul, in other cases, of a portion of the small intestines, and again it may be composed of the small intestines and omentum united. The disease is the same, whether composed of the one or the other, or both. In some instances, the hernia

is painful and troublesome, in others, but little inconvenience is experienced. When the tumor protrudes and becomes confined, it often produces death. In every instance, where there are colic pains, let it be ascertained by careful examination, whether hernia exists. I knew the case of a lady of sixteen summers, who had attended church during the day ; and while putting the teakettle over the fire, she was attacked with violent colic pains, as it was supposed. The family physician was immediately called, but could not succeed in relieving her. An experienced physician, with whom I was studying at the time, was called as counsel in the case. He immediately inquired if hernia existed. To this the at-

Fig. 50.

" *a*, *b*, represents the inguinal canal left for the passage of the spermatic cord, which is marked by the two dotted lines. *a* marks a little dotted circle, which is called the internal abdominal ring. It is the internal orifice of the inguinal canal. *b*, is the external abdominal ring, and is situated at the bony edge of the pelvis *g*. These parts are the most common location for hernia in men. This hernia is called inguinal. Just below this, *c* marks the spot where the tumor generally appears in femoral hernia. This is the most common variety in women. *d* designates the umbilicus where the vessels going to and coming from the after-birth, enter and pass out of the fœtus before birth. This is the seat of umbilical hernia. This is more common in women than men.

tending physician and patient, replied that they were not aware of any. Here he let it rest. The girl died within forty hours after the attack. A post mortem examination disclosed a strangulated hernia, of the size of a small chestnut, as the cause of the pain and death. The tumor was at the upper part of the thigh at the spot marked *c*, in fig. 50. This is the common place for hernia in females. Here a close and proper examination, would have detected the disease, and probably saved her life. Many of our citizens are cut down in the vigor of health, by colic, or inflammation of the bowels, when in reality, hernia alone was the true cause. I speak of this, that more attention may be given to this complaint by the people and physicians.

Mothers and nurses should carefully examine the lower part of the bowels, and upper anterior part of the thigh, in children, to see that no hernia exists, if they have tenderness and pain in the bowels.

In the primary stage there will be pain and tenderness at the point of the rupture. The intestines may protrude in considerable size, or they may not. If there is this sensation at the lower and anterior part of the bowels, or upper part of the thigh, upon its anterior part near the groin, attended by a tumor, immediately call upon a surgeon, and have an examination. Let this be observed, by both man and woman. In most instances they can be cured, if properly treated at the commencement of the disease. In all cases of hernia, it jeopardizes life, as soon as it becomes strangulated; hence the importance of having it seen by a surgeon at the onset, and a well adapted truss applied immediately.

In making efforts to return the protruding tumor, the parts at first should be relaxed as much as possible, which is effected by moderately bending the body upon the hips. The next object will be, the reduction of the parts forming the tumor. This is done by an operation called taxis. This requires tact and peculiar care, as the tumor may be of the size of a goose egg, and the aperture through which it has to pass, may not be half an inch in diameter. It would be as impossible to crowd the tu-

mor through the aperture at once, as it would be to put a handkerchief through a half-inch gimlet hole at one effort; but commencing at one corner, it may be easily drawn through. So can the hernia be reduced in a similar manner. A small portion must be passed up at a time, commencing with that part near the opening, close to the body. If pressure be made upon the whole tumor, the effort will be an ineffectual one. This pressure should be made with the end of the thumb and fingers, grasping the neck of the tumor, making moderately firm pressure upward and outward, in the direction of the canal through which the parts have passed. If a small portion can be returned, the whole can be. The effort should not be persisted in but for a short time, for active inflammation of the bowels may be produced by the pressure. Under such circumstances, send for a good surgeon, as the life of the individual is endangered. If he does not succeed in reducing the tumor, after relaxing the system by bleeding, the warm bath, &c., a surgical operation gives the only hope of saving the patient. In selecting trusses, obtain one that fits the person, or get none; as the design is to give no pain, and support the parts. Let the pressure he as light as it can be, and retain the intestines in their place.

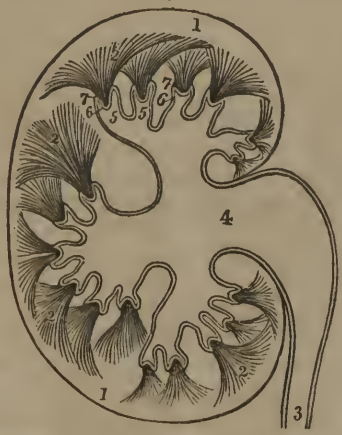
In all cases of hernia at the umbilicus in girls, a truss should be early worn.

OF THE KIDNEYS.

The kidneys, are the organs in which the urine is secreted, or separated from the blood. These large organs are situated above the haunch bone, at the back part of the abdominal cavity, and below the diaphragm. There is always a considerable amount of fat, or adipose matter, that surrounds them. In their structure, appearance, situation, and functions, they resemble, in a striking manner, the kidneys of animals. There are running from the kidneys, small hollow tubes, named ureters. These open into the lower and back part of the bladder. Through them the urine secreted in the kidneys, is pas-

sed into the bladder, which is a membranous organ, placed in the pelvic cavity. The bladder is composed of three coats, or membranes, like the intestines. The external or serous, the middle or muscular, the internal, or lining coat, named the mucous membrane. This is lined, or shielded, by a coating of mucus, which protects the membrane from the irritation of the urine.

Fig. 51.

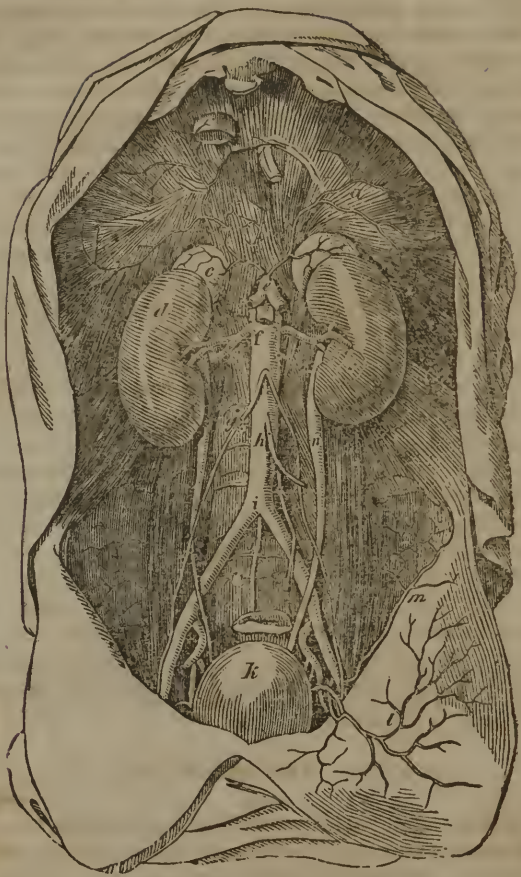


...e thin membrane surrounding the kidney. Immediately beneath this covering is a peculiar substance called the cortical, or bark, that sends inward prolongations; between which, is placed the medullary portion 2, 2, 2, 2. The pelvis is seen at 4, while 3 marks the ureter.

GRAVEL AND STRANGURY.

The kidneys, bladder, and their appendages, are often diseased, and most frequently the disease is termed "gravel." Although the disease does exist, it is not as common as most people imagine. Many influences combine to render these organs the seat of disease. They receive a vast amount of blood, from which the urine is secreted, and if this blood is impure, the urine will also be loaded with impurities. It is well known if a person take a quantity of the oil of turpentine into his stomach,

Fig. 52.



"In this, *a* and *b* show the tendinous part of the diaphragm or partition between the chest and abdomen: *d*, the kidney, with its fellow opposite; *f*, the *descending aorta*; *h*, an artery given off for the intestinal tube; *i*, where the great artery divides, to send a branch to each leg; *g*, the ascending great vein, conveying blood to the right side of the heart; *c*, the *capsule*, so called, belonging to the kidney, the use of which is unknown; *n*, the *ureter*, a tube which conveys the urine from the kidney to the under side of the bladder, where it terminates. The right ureter is seen on that side, also terminating in the bladder, *k*. *m*, *l*, are arteries; *o* is a small artery, which runs down, on the bone, into the pelvis."

the urine will be tinged by it in a few minutes; so of other articles, as garlic, or rhubarb.

The kidneys are organs of waste, like the skin; there exists between the two, a close and intimate sympathy. This may be seen when the surface of the body is chilled, or when there is great heat. If the action of the waste vessels of the skin be much increased, the kidneys will secrete but little urine. If the vessels of the surface be contracted and inactive, the kidneys become more active, and secrete more urine. This is illustrated in going from the hot, to the cold air. Inadequate and improper clothing, with impure air, are fruitful sources of urinary complaints. A prevention of these complaints would be to observe the conditions, mentioned in the sections on the skin, stomach, and lungs. In all diseases of these organs, give special attention to the skin and bowels, in seeking a cure of them. Medicines, if any are taken, should be of an anodyne andaperient character.

Treatment. Mucilages, as the flaxseed tea, solution of gum arabic, to which is added a little carbonate of soda, and five or ten drops of laudanum would be good. Fomentation, to the back and bowels would be beneficial. The warm bath with friction to the skin, sitting over the vapor of hot water and vinegar is efficacious. Aperient medicine, as equal parts of castor oil and sweet oil are valuable.

RESPIRATION.

The food, after it has been changed into chyle in the intestines, is transferred into the transverse vein, situated at the lower and anterior part of the neck. Here, it is mingled with the venous, or dark blood, returning from the head and arms, to the heart. This returning fluid and chyle, are not adapted to promote the growth of the system. It is not blood, but the basis of this circulating fluid, and it requires to be oxygenated, or brought in contact with the air, to suit the wants of man. The apparatus to oxydate the blood in the worm, is the skin; in fish, the gills; in animals and man, the lungs. This is not only apparent in man and animals, but the tiny

shrub, and the hardy tree, have their fluids acted upon by their lungs, viz : the leaves.

The apparatus to effect the change of the two fluids, in man, may be divided into three parts : 1st. The frame-work of the chest, viz : the bones. 2d. The muscles attached to the bones to move and change their relative position. 3d. The wind bag, called the lungs, placed within the cavity of the chest. The bones are the twelve vertebræ of the spine, commencing with the eighth from the base of the skull. To each of these bones are attached two ribs, one on each side. These ribs are of unequal length, and have button-like heads, by which an attachment is made to the spine, and the slightest movement of the spinal column affects these ribs. They increase in length, from the first to the tenth, from the tenth downward, they decrease in length. The curve of the ribs is irregular,—so much so, that if a rib be thrown upon a table, its irregularity will prevent its immediately being in a state of rest. The upper ribs, nearest the neck, are the most curved. There is attached to the anterior extremity of the ribs, a cartilage that connects them with the sternum or breast bone. The upper cartilages are shorter, and more resisting than the lower ones, which are found to be longer, smaller, and consequently more flexible. These cartilages sometimes become ossified, or changed into bone, but it rarely happens except in persons who have passed the meridian of life. When this change is effected, respiration is impeded. The two lower ribs have no connection with the sternum, but unite themselves to the abdominal muscles.

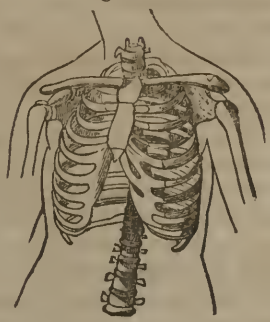
The sternum, or breast bone of the child, is composed of seven pieces, in the adult they are united into three. In youth, and in middle aged persons, the lower third of the sternum is cartilaginous, and projects forward, in the natural form, to give room to the stomach and liver, that lie immediately under it. Among the fashionable, this projection is regarded as a deformity. From the increased length of both the ribs and cartilages, we might reasonably suppose the lower part of the chest should be broader, and fuller than the upper.

The small, contracted chests of the modern belle, are in reality as much a deformity, as the puny foot of the Chinese lady, and far more destructive to health.

Skeletons of a well formed female chest, and a contracted one.

Fig. 53.

Fig. 54.



"By comparing the accompanying plan of a well developed and naturally proportioned female chest, with the frightful skeleton exhibited in figure 53, the difference is strikingly apparent. Here is breadth, space for the lungs to act in, and the short ribs are thrown outwardly, instead of being curved and twisted towards the spine, by which ample space is afforded for the free action of all those organs, which, in the other frame, were *too small to sustain life*. Fig 53, may be regarded as the exact shape and figure of a short-lived female; and this may be contemplated as an equally true model of the frame of another, who, so far as life depends upon a well-formed body, would live to a good old age.

Fig. 53. An outline is here presented of a female, to show the condition of the bones, as they appear after death, in every woman who has habitually worn stays. All the false ribs, from the lower end of the breast bone, are unnaturally cramped inwardly towards the spine, so that the liver, stomach, and other digestive organs in the immediate vicinity, are pressed into such small compass that their functions are interrupted, and, in fact, all the vessels, bones, and viscera, on which the individual is constantly depending for health, are more or less distorted and enfeebled."

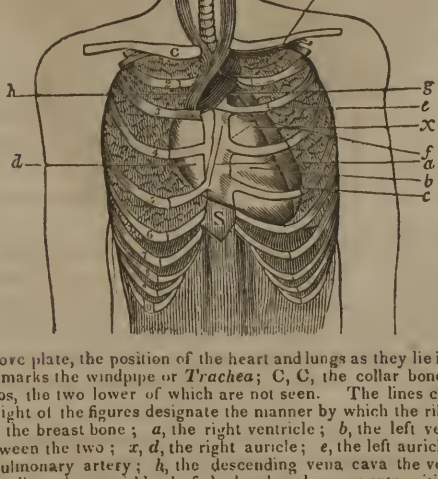
The ribs and cartilages, in the natural form, being longer, and likewise the position of them being more oblique at the lower part of the chest, they give more latitude to full and free respiration. The ribs are moved by two sets of muscles. The one set is attached to the back of the head and sides of the neck, at one extremity; and to the sternum, clavicle, scapula, and upper ribs, (or to the breast, collar, shoulder bone, and upper ribs,) at the other. The head and neck being the fixed points, when the muscles shorten, or contract, the parts to which the

other extremity is attached, become elevated, and with these parts, all the ribs are, or should be, elevated. This arrangement accounts for the equal elevation of all the ribs. But an observer would see, that the lower ribs are raised much more than the upper ones. This is effected by the action of another set of muscles, situated between the ribs; these are named the intercostal. Each one is attached, at its upper extremity, to the lower edge of the first rib, and at its opposite extremity, it makes an attachment to the upper edge of another rib. The upper or first rib is the fixed point, the lower one, being moveable, is elevated. The second rib is acted upon by one set of intercostal muscles; the lower rib by eleven. The elevation of the lower rib from the action of this set of muscles, will be eleven times as much as the second rib. Thus the chest is not only more capacious at its lower part, but here it is enlarged by the increased elevation of the ribs.

To the margin of the ribs is attached a thin, muscular membrane. This membrane separates the chest from the abdomen. When in a state of rest, it is elevated in the centre, presenting a convex surface superiorly or on the upper surface, and concave inferiorly or on the lower surface. When the muscles attached to the ribs contract, they are all elevated,—the lower, much more than the upper ones. By this elevation, the cavity of the chest is increased laterally, and outwardly, and, at the same time, the muscular membrane, the diaphragm, contracts. The protruded ribs being the fixed point of this muscle, the central part that projects into the chest, is depressed; making a plane of its surface. By this arrangement, the cavity of the chest is enlarged inferiorly. In looking at the movements of the chest, we see an adaptation of the bones and muscles to each other, and the lungs, also, are found to dilate most at the lower part of the chest. This is needful, that there be a perfect harmony of the structure and uses of this respiratory apparatus. Within the cavity formed by the diaphragm, the spine, the ribs, and muscles, are found the lungs, (sometimes called the lights,) the heart, and large blood vessels.

This cavity is divided into two parts, the right and left, by a partition called the mediastinum. In the right compartment, is found the right lung, which is divided into three lobes; in the left, is found the left lung, divided into two lobes, and the heart.

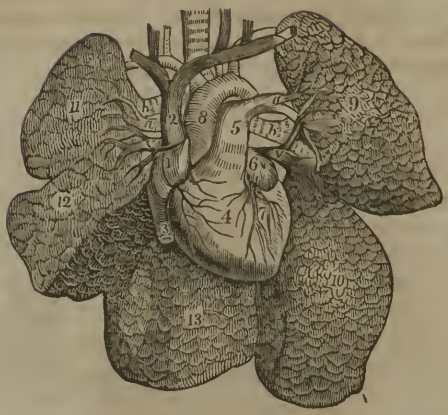
Fig. 55.



In the above plate, the position of the heart and lungs as they lie in the chest is seen: T, marks the windpipe or *Trachea*; C, C, the collar bones; from 1 to 10 the ribs, the two lower of which are not seen. The lines crossing the ribs at the right of the figures designate the manner by which the ribs are connected with the breast bone; *a*, the right ventricle; *b*, the left ventricle; *c*, division between the two; *x*, *d*, the right auricle; *e*, the left auricle; A, the aorta; *g*, pulmonary artery; *h*, the descending vena cava the vessel which returns the collected venous blood of the head and upper extremities; S, the cartilaginous extremity of the breast bone.

The external membrane of the lung, is called the pleura. It is very thin, covering both lungs, and lining the cavity of the chest. The next tissue is the parenchyma, or substance of the lungs. It is made up of a congeries of air tubes, arteries, veins, nerves, and absorbents. These vessels are connected together by cellular tissue, which is the medium of union throughout the system. The mucous coat of the lungs, or mucous membrane, is that which lines the air tubes, commonly called the bronchi, together with the air vesicles.

Fig. 56.



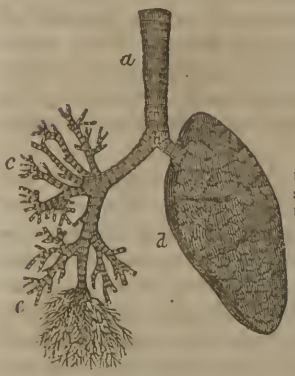
The above view exhibits the heart and lungs removed from the chest, and the lungs freed from all other attachments. They are arranged so as to show the parts with greater accuracy. 1, The right auricle of the heart. 2, The superior vena cava. 3, The inferior vena cava. 4. The right ventricle. 5, The pulmonary artery issuing from it. *a*, *a*, The pulmonary artery (right and left) entering the lungs. *b*, *b*, Bronchi or air tubes entering the lungs. *v*, *v*, pulmonary veins issuing from the lungs. 6, The left auricle. 7, The left ventricle. 8, The aorta. 9, The upper lobe of the left lung 10, Its lower lobes. 11, The upper lobe of the right lung. 12, The middle lobe. 13, The lower lobe.

The trachea, or windpipe, is an appendage of the lungs. The upper part is called the larynx, situated at the upper and anterior part of the neck, forming a projecting prominence. (This is known by the name of Adam's apple.) The part between this and the sternum, is called the trachea. This divides into two branches, the one passing to the right lung, the other to the left. They are again divided and subdivided, until the tubes are exceedingly small.

At the extremity of these minute tubes, there are situated minute ovoid vesicles, about the one hundreth of an inch in diameter. These are the air cells of the lungs. A homely comparison may be made between these parts, and a grape vine, loaded with grapes, by supposing the vine and grapes hollow, having nothing but their external

coats. The trunk being the large tube under them, represents the windpipe; the stems being the subdivision of the great tube, the bronchi; and the thickly clustered grapes, the air vesicles. The inspired air passes through the trachea, bronchi, and enters the air vesicles which it distends.

Fig. 57.



In the engraving 57, *a*, represents the trachea or windpipe, *d*, the left lung, *c*, *c*, small tubes termed bronchi opening into the air vesicles, *b*, bifurcation.

Fig. 58.

Fig. 58, bronchial tube and air cells of the lungs much magnified, 1, minute bronchial tube, 2, 2, 2, group of air cells, 3, the same parts laid open.

The venous blood, and the chyle, are brought from the right side of the heart in the pulmonary artery. This divides into two large branches, going to each lung; each of these two vessels is divided into thousands of hair-like arteries, which pass over the very minute ovoid vesicles.

The venous blood and chyle, are carried through these capillary vessels, and as they pass over the vesicles, the blood and air come in contact. At this point the blood and chyle is changed into a bright red, or vermillion hue, and it is then returned through another set of vessels to the left side of the heart. As it is the inhaled air which is the effective agent in converting the chyle produced from our food into blood, its composition will here be inserted. By chemical analysis, it is found to consist of two gases, oxygen and nitrogen, or azote. They exist in the proportion of one-fifth of the former, to four-fifths of the latter. These gases have also combined with them, a small quantity of carbonic acid gas, also the effluvia of flowers.

When the muscles of the chest and diaphragm are contracted, causing an expansion of the chest, the air rushes in through the trachea and bronchial tubes, and inflates, or distends the air vesicles, at the extremity of the bronchial tubes. The blood, in passing over these inflated vesicles, is acted upon by the oxygen, and purified. It is not known, whether the azote acts upon the blood or not, though some theoretical speculations have existed in regard to it.

Respiration, or breathing, consists in inhaling the air into the lungs, and expelling it from them. At each act of respiration, the muscles of the chest elevate the ribs, and the diaphragm is depressed at the same time. The abdominal muscles are relaxed by this action producing a cavity or vacuum in the lungs. This vacuum is much increased by the previous act of expiration, but it is soon filled by the air which passes into the tubes by its own weight. From this we see, that the lungs are mere passive agents, dilating and contracting as the chest is expanded, or contracted. At each respiration, all the air in the lungs is not expelled, but a considerable portion remains, called the residual air, or air of the lungs. This sometimes becomes an important affair in certain criminal trials, as in infanticide, or the murder of new-born infants. Lungs that have been inflated, always contain some air, which is not expelled in the death-struggle. If the lungs

of the infant float upon the water, it is regarded as sufficient proof that the child was living at birth.

In a state of rest the number of respirations in a healthy man are from 14 to 18 in a minute; usually about four pulsations, or beats of the heart, to one respiration. In disease the respiration is increased in frequency, more than the action of the heart, particularly in diseases of the lungs. The quantity of air inhaled, depends upon the size of the lungs, and the freedom of expanding the chest. A medium computation is found to be about 20 cubic inches of air at each act of respiration. This, in twenty-four hours, would amount to 460,800 cubic inches, or 266 1-3 cubic feet. The blood in the capillary vessels of the lungs, is separated from the air in the bronchi and vesicles, by the interposition of the very thin coat of the hair-like vessels, and the almost infinitely thin membrane, that forms the wall of the air cells. It may be a query how the air which enters the lungs, acts upon the blood,—and how the blood can be retained in its own proper set of vessels, and yet be exposed to the influence of the air. Some experiments may elucidate somewhat this point. "Take a glass tube and tie over one end of it a piece of bladder, or some other membrane, then, having partly filled the tube with a solution of gum, or sugar, immerse it with the end covered with the membrane, downwards in a vessel nearly filled with water. The fluid from the vessel will pass into that in the tube, and the latter will be seen to rise at once. Reverse the experiment, by putting the sugared water into the vessel, and the other into the tube. The fluid in the tube will sink, because the same passage of fluids takes place, but in the opposite direction. Thus we see, that there is an attraction between one fluid and another, or an affinity of one fluid for another." The pure water has an affinity for the sugared; the one passes through the bladder more easily and readily, than the other.

Put a mixture of water and alcohol into a phial, and leave it uncorked. The alcohol will have an affinity for the air, and will be diffused through it more readily than water, when there is no intervening obstacle. But tie a

piece of bladder over the mouth of the phial, and let it stand a few days. The diluted alcohol will become stronger, the water having passed through the bladder, leaving the alcohol. Here it will be seen that alcohol has a greater affinity for the air than water; but that the water will more readily penetrate, or pass through a membrane, than the alcohol. By the aid of these experiments we will endeavor to explain the action of the blood and air upon each other, in the lungs. The dark, venous blood passes in the lungs through the pulmonary artery; this blood contains a large amount of carbonic acid gas, which is distributed over the bronchial tubes and vesicles, by the many and minute hair-like, or capillary vessels.

The air, which is composed of oxygen and nitrogen, is passed into the air vessels, which become inflated. There is interposed between the air and blood in the lungs, an exceedingly thin coat of the capillary vessels, and also of the air vesicles. This separating membrane is similar, in its mechanical arrangement, to the membranous bladder in the experiments described in preceding sections. The oxygen of the air has a greater affinity for the dark venous blood, than it has for the nitrogen, with which it is united in the lungs; the membrane interposed between the blood and the air, permits the oxygen to pass through it, the membrane being permeable to the oxygen, but not to the nitrogen. The oxygen of the air having a greater affinity for the venous blood, than it has for the nitrogen, permeates the membrane to unite with the blood, as the water leaves the alcohol and passes through the membrane to unite with the air. The carbonic acid gas that the blood contains, passes through this thin membrane, leaving the blood and uniting with the air upon the same principle, and in a similar way to the passage of oxygen from the air to the blood.

The blood having received a supply of oxygen, and parted with a portion of carbonic gas, undergoes a change in its color from the dark modena hue, to the bright scarlet. In this state it is returned to the left side of the heart. From this side of the heart it is distributed to the different parts of the system. In the minute vessels of

the system there is a union of the carbon and oxygen, forming carbonic acid gas; by this the blood is rendered impure and dark, and is returned through the veins to the right side of the heart.

The air in the lungs having less oxygen and containing carbonic acid gas, is expelled from the lungs in the act of expiration, which is repeated from 14 to 20 times each minute. During the interval of respiration, the change of the blood is progressing in the lungs, as there is residual air remaining. The quantity of carbonic acid gas thrown out of the system, will depend upon the quantity of oxygen supplied by the atmosphere, and the amount of food and exercise taken, and the size of the lungs. The quantity of carbon will be proportioned to the food and exercise taken. The quantity of oxygen, and the volume of lungs, should be proportioned to the amount of carbon to be eliminated from the system.

VOLUME OF LUNGS.

Let us first examine the necessity of ample volume of lungs. If a gill of alcohol, mixed with a gill of water, be poured into a vessel having a square foot of surface, then tie over the vessel a membrane, as a bladder, and suppose the water will evaporate in twenty-four hours. If the surface was only six inches square, only one-fourth of the water would evaporate through the membrane,—leaving the water mixed with the alcohol. If the surface be extended to two square feet, the water would evaporate in twelve hours. Apply this principle to the lungs: Suppose there is two hundred cubic feet of carbonic acid gas to be carried out of the system, each twenty-four hours. This gas in twenty-four hours would pass through a membrane of vesicular surface of two thousand square feet; and if the lungs were diminished in size, so there were only one thousand square feet of vesicular membrane, this amount of gas could not, and would not, be duly carried from the system. Under such circumstances, the blood would not be purified, and this unpurified blood would be sent to every part of the system. Again, sup-

pose the two thousand square feet of membrane would transmit two hundred cubic feet of oxygen into the system each twenty-four hours; (the quantity demanded by the wants of the system.) If it is diminished one-half, the necessary amount of oxygen will not pass into the blood. From the above illustrations, we may learn the importance of having well developed chests, and voluminous lungs. By increasing the size of the lungs, the oxygen is supplied to the blood more abundantly, and it is more perfectly deprived of its carbonic acid gas. The close dressing to the chest of the child, will prevent its perfect development, as truly as does the tight dressing of the Chinese lady's foot prevent its growth. It is more easily done in infancy, as the ribs and soft parts are yielding, but it *may* be done at any period of life. As the greatest expansion of the lungs is in the lower part of the chest, and as in the lower half of the lungs, the greatest amount of air passes, so here the greatest amount of carbon is carried from the blood; should the chest be contrated here, the purifying principle of the air cannot do its office. The means for expanding and developing the chest, are exercise in the open air, reading aloud, singing, sitting erect, and fully inflating the lungs. This should be commenced in childhood, and steadily persevered in, to old age. By so doing, the contracted consumptive chest, in many cases, can be corrected, and the tendency to consumption removed.

FREE MOVEMENT OF THE RIBS AND DIAPHRAGM.

The movement of the diaphragm must be unrestrained, to preserve the health of the system. To carry off the former supposed quantity of water from the alcohol, let the surface of the membrane be exposed to twenty cubic inches of air, and that this be changed twenty times each minute, and as the air becomes loaded with vapor, let it be removed and a fresh quantity supplied. If only one-half the amount of air requisite, is supplied each minute, one-half as much water will be removed from the alcohol through the membrane, in twenty-four

hours; consequently, the alcohol would be impure, the water not being entirely removed. We will now turn our attention to the lungs. Suppose they are of ample size, and, to purify the blood, twenty cubic inches of air is inhaled at each inspiration, and will expand them properly. This is the quantity necessary to supply the blood with oxygen and also to combine with the carbon of the system, that an adequate amount of carbonic acid be eliminated through the lungs.

Restrain the elevation of the ribs, and depression of the diaphragm, and reduce the quantity of air passed into the lungs to ten cubic inches, and notice the result. The venous blood will be returned to the system loaded with an undue amount of the poisonous gas, and only half the called for amount of oxygen is introduced into the system. It is in this way that tight clothing influences the system. The movement of the lower ribs and diaphragm being restrained, the quantity of air necessary to be inhaled into the lungs is diminshed, and the whole system must suffer from an infringement of the organic laws. The contrast between the free and expansive chest, and the compressed waist, is well exhibited in Figures 53 and 54.

The effect of the contraction of the lower ribs and its influence upon the lungs, is too visibly seen in the pale and ghastly hue of the faces of city misses. By reason of this compression, the blood does not duly receive the stimulus of oxygen; and consequently the rapidity of its circulation is impeded. The blood passing thus sluggishly through the system is conveyed to the different organs, enfeebling their action, and inevitably causing disease.

The prolific cause of the contracted chests, is the present style of dress that is almost universal. These baneful fashions are copied from the periodicals so widely circulated, containing a "fashion plate" of the "latest fashions" from Paris. In every instance, the contracted, deformed, and as it is called, "neat, lady-like waist," is portrayed in all its "fascinating loveliness." These periodicals are found on every centre table, and

they exercise an influence, almost omnipotent. If the plates which corrupt the morals, are excluded by civil legislation, with the same propriety, ought not those to be suppressed that have a tendency to induce a course of conduct so adverse to health, by rendering the blood impure.

PURE AIR AND VENTILATION OF ROOMS.

Of the air taken into the lungs, at each respiration, only the oxygen passes through the membrane of the air vessels, to become mixed with the blood. The nitrogen, which constitutes four-fifths of the inhaled air, is thrown out by the lungs in the act of expiration. The air for respiration should contain one-fifth part of oxygen. At each time of inhalation, a portion of the oxygen permiates the vesicular membrane and unites with the blood. And it receives from the blood about the same amount of carbonic acid gas. This loss of oxygen and gain of carbonic acid, unfits the air to be used in respiration a second time.

In addition to the vitiation of the air, there is passing from the skin and lungs, a large amount of the decayed and waste matter of the system. This amounts to two or more pounds each twenty-four hours, and is diffused throughout the room. If there be not fresh air continually coming into the room, the individual there sitting, will breathe this noxious air, which is another cause of impure blood.

The same principle is demonstrated in the mixture of alcohol and water. If the air be dry, the water will pass readily through the membrane, if it be saturated with moisture, but little water will pass through. If the air be free from carbonic acid gas, it will readily and with seeming avidity take from the blood, through the vesicular membrane the carbonic acid that may be mixed with the venous blood. If, like the air saturated with water, it contains as much carbonic acid, as the air will hold in solution, it will not attract any gas from the venous blood, and the fluid will be returned through the

various vessels, unfit to repair the waste of the system. From this, we learn that impure air breathed into the lungs has the same effect, as when the contracted chest prevents the pure air from purifying the blood. For this reason, workshops, churches, and dwelling houses, should be so constructed as to admit pure air freely and constantly, and to permit the escape of the impure and vitiated air. This is of more importance, than the warming of houses. We can compensate for the deficiency of a stove, by an extra garment, or an increased quantity of food; but neither garment, exercise, food, or any thing else will compensate for fresh air.

The same may be said of school-houses. The brain of the scholar must be stimulated by pure blood, or its proper functions will not be performed. The pupil will complain of headache, from irritation of the brain, caused by a diminution of pure oxygenated blood, and an excess of carbonic acid gas. Above all, sleeping rooms should be well ventilated, that the air in the morning be as pure as when retiring at night. A room thus ventilated, would prevent the morning headaches and the want of appetite, so common among the feeble. *Every* room should be so constructed, that pure air can be admitted freely, as all deviations tend to weaken and destroy the system. The impure air of sleeping rooms is probably destroying more than intemperance. Look around the country, and those men and families that are the most exposed, that live in huts, but little superior to the sheds that shelter the farmer's flocks, are found to be the most healthy and robust. Headaches, liver complaints, and coughs, are almost unknown to them; not so with those who spend their days and nights in rooms, where the sashes of the windows are caulked, or perchance doubled, to prevent the keen, but healthy air of winter from enter their apartments. Disease and suffering are their constant companions. The one breathes the pure air, the other does not.

Influence of the Brain upon the Lungs. The condition of the brain exercises an influence upon respiration.

If it be enfeebled by the depressing passions of the mind, or by disease, the action of the respiratory muscles and the diaphragm will be inefficient.

This is exemplified in those individuals, who have met with reverses of fortune, where character and property were lost. Thousands are brought to a premature grave, by the effect of depressed spirits. A striking instance is related by Laennec. In a female religious establishment in France, were practiced great austerities; the mind was kept fixed in contemplating the terrible truths of religion, and in mortifying the flesh. The whole establishment in the space of ten years was several times depopulated, with the exception of the persons employed at the gate, in the kitchen, and garden, with that fatal disease, consumption. This institution did not long exist, being exterminated by order of the French government.

Effects of impure blood upon the system. The blood may be rendered impure by either of the influences before described, or by any two, or all of them combined. We will note the effect it has upon the bones. As one condition of health and strength, they demand pure blood. If this is not supplied to them, they become soft and brittle, their vitality is impaired, diseases of various kinds is the ultimate result. Another portion of the blood goes to the 400 muscles. These organs are attached to and act upon the bones. Upon the health and contractile energy of the muscles, depends the ability to move and work. Give these organs of motion impure blood,—this being to them an unhealthy stimulus, —they feel soft, they are weak, the step is feeble, and the movement of the arm inefficient and the muscles of the back also refuse to perform their usual amount of labor.

This impure blood goes to the stomach, liver, and other organs subservient to the digestion of food. This blood having an inadequate amount of oxygen, and a superabundance of carbonic acid gas, impairs the digestive process, causing a faintness of the stomach, loss of appetite, and a deranged state of the large and small intes-

tines. The person has the reputation of being troubled with the dyspepsia, or liver complaint. Another portion goes to the lungs in the *nutrient* arteries. The delicate structure of these organs in which the blood is, or should be purified, needs the requisite amount of pure blood to give them vigor and health. The blood not being of that character, the lungs themselves lose their tone and ability to purify the blood ceases in a little time, even if they were permitted to expand freely. This dark, sluggish blood also passes to the skin; the health and beauty of this tissue require well oxygenated blood. This not existing, the surface becomes covered with pimples and blotches, and the individual suffers from "humors," as they are called. Drinks made of various kinds of herbs, pills and powders, are taken for this disease. They will do but little if any good while the cause of impurity of the blood is continued. This impure blood is sent to the brain. If this important organ is stimulated by impure blood, the nervous headache, bilious headache, and all kinds of aches and confusion of ideas, loss of memory, impaired intellect, dimness of vision, and dullness of hearing, are attendants from this impure stimulus. Often, in the process of time, it becomes disorganized, and the brittle thread of life is broken.

COLDS.

The diseases of the lungs are of such a character, that much interest is attached to them. The simple cold, or cough, its nature and treatment, is not well understood by the matrons of the community; although each may have their "cure all" for it, or some grand specific, usually it is treated in a manner, that coincides with the popular adage, "stuff a cold and starve a fever." This stuffing is generally accomplished by taking large quantities of food and hot stimulating teas. Many times the latter is used alone. Many have suffered and recovered, and the treatment from this has been deemed a good one. Indeed, many have recovered from fever and small pox, seventy years since, when no cold or

fresh air was allowed these patients; they lived, notwithstanding the treatment was pernicious. The reputation of any physician would be destroyed at the present time, did they now practice in this way for these diseases. Success is not proof of the correctness of the practice, in this, no more than it was in the fever, and small pox, many years since. A knowledge of the character of the disease, is essential to the proper treatment and speedy relief of the patient. Let the treatment be safe, efficacious and simple, and the mass of the people will fully understand and practice therefrom.

In most instances, a cold is induced by a chill, that induces a contraction of the blood vessels of the skin. The great waste carried off by the agency of the exhalent vessels of this membrane, is retained in the system, and a great portion of it is turned to the mucous membrane of the lungs. It is a law of the system that organs similar in their functions have sympathy with each other. The accumulation of blood, loaded with the waste matter that should have been carried from the system, creates an unusual fulness in the minute vessels, that nourish the muco bronchial membrane. The waste matter causes an irritation of the minute vessels, and this irritation increases the flow of blood to the nutrient small arteries of the lungs. There is a thickening of the lining membrane of the lungs, caused by the fulness of the small vessels before described; and the swelling of this membrane is similar to the thickening of the external coat of the eye, that sometimes is thrown into a fold in inflammation of this organ. The membrane being thickened, the small air tubes are nearly, or quite closed, and the air is prevented from passing into the vesicles.

As fluids do not pass as readily through a thick membrane, as a thin one, the air that passes into the cells, does not impart oxygen to the blood and receive carbonic acid as if it was thinner. The blood being partially purified, does not pass with facility through the lungs. There is an accumulation of blood in two sets of vessels, the pulmonary and the nutrient, and this obstruction of

the circulation, is an additional obstacle to the passage of air into the lungs.

When food is taken, it is changed into chyle, and passed into the veins; the drinks are also passed into the same vessels. The chyle and the drink increases the amount of fluid in the vessels of the lungs, and by these the breathing is rendered more difficult; and uniformly no relief is obtained, until the vessels of the skin are called into action by free perspiration, or the secreted mucous from the lungs.

Treatment:—One thing is called for to effect a speedy cure, viz.: to diminish the amount of fluid in the vessels of the lungs. This can be done in two ways. 1st. By diminishing the quantity of blood in the system. 2d. By diverting it from the lungs to the skin. The first condition can be easily and safely effected, by abstaining from all food, and drinking no more than a *gill* in twenty-four hours. By this procedure, the quantity of blood will be speedily diminished, and the lungs relieved of the accumulated fluid. The second condition can be obtained by resorting to the warm or vapor bath. These, and the common sweat, will invite the blood to the skin from the lungs. Keep up the action of the skin for a few hours, and the lungs will be entirely relieved. In some instances, emetics and cathartics may be called for, and necessary. Mucilages, as gum Arabic, slippery-elm bark, would be good.

After the system is relieved, the skin is more impressible to cold, and consequently, needs careful protection by clothing.

COUGHS.

In cases of a cold leaving the lungs weak, attended by a cough, and the expectoration of matter, the following treatment will be proper: Each morning and evening, bathe the skin with cold water, saturated with salt, rubbing every part of the skin dry with a crash towel. By constant rubbing for fifteen minutes, there will be created an active and red state of the skin. Put on clean flan-

nels, sleep in a room that is large and well ventilated; if the appetite is poor, and a confined state of the bowels exists, the following prescription would be beneficial, after attending to the skin as before directed: Quassia, 1 ounce; peppermint herb, 1-2 ounce; epsom salts, 1-2 ounce. Steep in one pint of water. Give a table spoonful three times each day. After the bowels and skin have received due attention, the following may be given to allay the cough: Thoroughwort, 1-4 ounce; black snake-root, 1-2 ounce; elecampane root, 1 ounce; rhubarb, 1-4 ounce; hops, 1-2 ounce. Steep in one pint of water. Add loaf sugar, 1 pound. Take a table spoonful morning and evening. Exercise in the open air; let the clothing be adapted to the weather. Follow the above, and most coughs will be benefitted. In all cases of long continued coughs, or colds, a moderate amount of nutrient food must be taken, three or four times each day. The withdrawing of food will only answer in colds recently taken, and that only for three or four days.

CONSUMPTION.

Treat consumptive coughs, asin the preceding section. Have the person clothe in flannels, and exercise freely in the open air.

To this add a free expansion of the chest, by sitting erect, throwing the shoulders back, and filling the lungs as full as can be done without causing uneasiness. This done six or eight times each day, from twenty to thirty minutes each time, and persevered in for many weeks, will be found quite beneficial. In cases of scrofula, tendency to consumption, weakness of the voice, shortness of breath, these means should be under the eye and advice of the understanding physician.

PAIN IN THE SIDE.

In all cases of pain about the chest, create an action upon the skin, and see that it is maintained; correct the

condition of the stomach and bowels, take nutrient food, with little drink, and it will have a tendency to remove the pain. After attending to the state of the skin generally, by bathing and friction, small doses of rhubarb and sulphur, may be given in equal parts. The chest may be well rubbed with a liniment, composed of equal parts of camphorated spirit, oil of hemlock, olive oil, and spirits of ammonia, mixed well and applied once in eight hours, rubbing the chest until the skin looks red.

Mustard seed poultices, plasters of hemlock gum, galbanum, and sometimes blisters would be good applications.

ASTHMA.

This disease is not well understood. The treatment is *empirical*. Some cases are relieved, by blisters between the shoulders repeated and continued for some weeks. Smoking the leaves of the datura stramonium will sometimes give relief. Burning cloth dipped in a solution of salt petre is good to relieve paroxysms.

The following is the treatment upon which I most rely. Apply blisters between the shoulders, and take a table spoonful of the following syrup once in five hours.

℞	Actea Racemosa	1 ounce.
	Lobelia	1-4 ounce.
	Rhubarb	1-2 ounce.

Steep in one pint of water then add hydriodate Potassa, 2 drachms.

SPITTING OF BLOOD.

The spitting of blood is usually regarded as a serious matter. It may, or it may not indicate serious disease of the lungs.

Treatment. Have the person remain at rest, bathe the feet in warm water, apply smart friction to the skin with a coarse crash towel. Among the medicines used for this affection, common salt, and cayenne pepper are as good as any. An emetic of ipecac is sometimes beneficial.

CROUP.

In cases of croup, the disease is situated in the larynx, or upper part of the windpipe ; as this disease is active in its character, and runs its course in a few hours, the remedies must be prompt to be effective. Put the feet of the child into hot water, give the skin a sponging with water, in which a large amonnt of salt is dissolved ; follow this with smart continued friction, with a coarse, crash towel, till the skin looks quite red over the entire system. Apply cloths dipped in water as hot as can be possibly endured, in which a large amount of salt is dissolved, to the throat of the child. Change these cloths very frequently, so as to keep them very hot. Give an emetic to induce vomiting immediately. In these cases, always send for a physician immediately.

QUINSY.

Many children have croupy breathing every time they take cold. These attacks usually occur at night, when the child is asleep, and the muscular system relaxed. This distressed breathing is frequently the result of enlarged tonsils in the throat, (or what is sometimes called the almonds of the ear, yet they have no connection with the ear.) These may be seen at the root of the tongue, and back part of the throat ; and they appear like small prominences, nearly filling up the throat when awake, and quite doing it when asleep. The voice of such a child is seldom clear, and the mouth is open in breathing.

Another reason why it is more apparent at night is the impure air of the sleeping room, which vitiates the blood and thus enfeebles the muscles of respiration. The treatment of such cases is simple. In every case of enlarged tonsils have them removed by the surgeon. The operation causes but little pain and is attended with no danger. Keeping such enlarged tonsils causes deformities of the chest, beside producing suffering and jeopardizing life. Children predisposed to the croup should always sleep in the pure air, and be bathed with cold water

every morning. Pure air tends to render the blood more stimulating, and a healthy state of the digestive organs tends to the same end. These are the main things to be attended to, as medicines are only assistants to the powers of the system.

TREATMENT OF DROWNED PERSONS.

When a person has been immersed in water and apparently dead from drowning, it is a matter of much importance, that the proper means be assiduously used to resuscitate such persons. The following directions are from one of the ablest men in the country, connected with the surgical profession. "Immediately as soon as the body is removed from the water, press the chest suddenly and forcibly downward and backward, and instantly discontinue the pressure. Repeat this without interruption, until a pair of common bellows can be procured, when obtained, introduce the nozzle well upon the base of the tongue. Surround the mouth with a towel or handkerchief and close it. Direct a bystander to press firmly upon the projecting part of the neck, (called Adam's apple) and use the bellows actively. Then press upon the chest to expel the air from the lungs, to imitate natural breathing. Continue this an hour at least, unless signs of natural breathing come on. Wrap the body in warm blankets and place it near the fire and do every thing to preserve the natural warmth, as well as to impart artificial heat if possible. Every thing, however, is secondary, to inflating the lungs. Send for medical aid immediately. Avoid all frictions until respiration shall be in some degree established.

VALENTINE MOTT,

Surgeon General of American Shipwrecks Society."

May 1844.

In cases of attempts to commit suicide by hanging, the phenomena of death are very similar to those of cessation of life in drowning. *Treatment.* Take the person down,

remove the cord from the neck, then adopt the treatment advised in the section upon drowned persons.

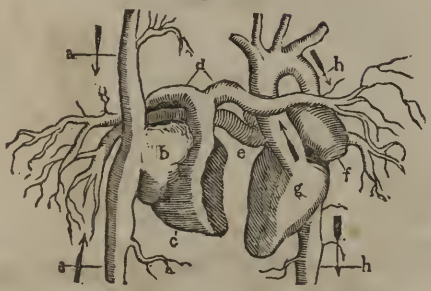
CIRCULATION.

The circulation of blood in the system, is effected by the agency of the heart, arteries, and veins. This function was not well understood by the ancients. They found, after death, that the heart was composed of two parts: the vessels of one part being filled with coagulated blood, while those of the other part were entirely empty. The arteries, or those vessels which opened into the side of the heart, which contained no blood, were found empty,—while the veins, or those vessels which opened into the other side, were found to be filled with clotted blood. Hence they inferred, that the side of the heart and vessels leading to it, which contained blood after death, were the vessels that carried the blood to the different parts of the system; and the empty side of the heart, and set of vessels, were subservient to the circulation of a very subtile fluid, called by them animal spirits.

This theory was generally received and adopted, until the days of Harvey. He taught that one set of vessels, called veins, carried the blood from the different parts of the system to the right side of the heart; that another set of vessels, called pulmonary arteries, carried the blood from the right side of the heart to the lungs; another set of vessels, called pulmonary veins, carried the blood from the lungs to the left side of the heart; and that another set, named the systemic arteries, carried the blood to the different and many parts of the system, from the left side of the heart. This view of the circulation, makes the heart a double organ, the one side receiving and transmitting one kind of blood, while the other side receives and transmits another kind. The heart is found to be of this character in man, and in all warm blooded animals. Notwithstanding the two hearts are united within a single envelope, the right and left

cavities are perfectly distinct from each other, as represented in fig. 59.

Fig. 59.



"By this engraving, the reader will readily understand what we mean by the *two hearts* of man, and other warm blooded animals, as they are here exhibited, and as they appear when dissected apart. Each one of them is a perfect organ by itself, and the one is perfectly independent of the other. That having the letter *b* upon it is the *right* heart, and that with a *g*, the *left*. This is a front view, or like looking into the chest of another person. The right heart is the engine of the *lungs*, for it supplies those organs exclusively. The left heart throws the blood, as already remarked in the text, round the curve above *g*, in the direction indicated by the arrows, over the entire body.

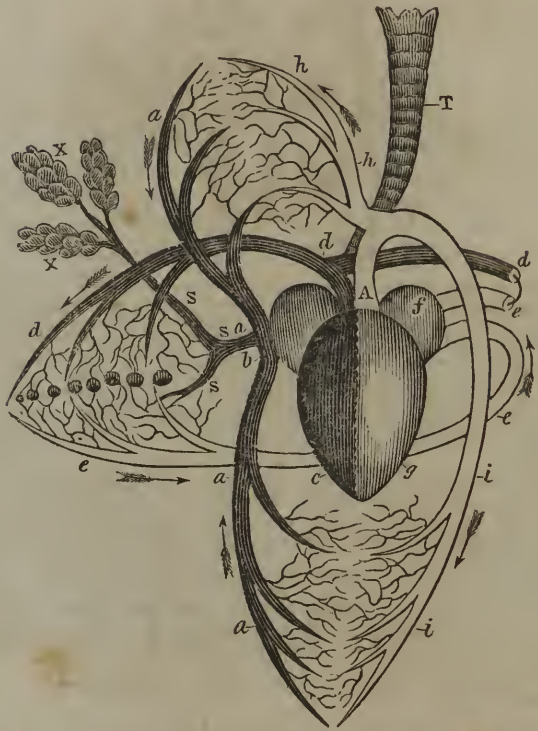
"*a*, *a*, are the *cavas*, or great veins, returning blood from the head and arms, and lower extremities. The uppermost is the *superior vena cava*, and the one below the *inferior vena cava*. The arrows show the direction of the returning currents of venous blood, to *b*, the *auricle*, which forces it into *c*, the *ventricle*, which again forces it up into *a d*, the pulmonary artery, where it divides to go to each lung; *e*, is one of the *four pulmonary veins*, which convey the blood, just forced into the lungs, into the *auricle f*, of the left heart. When that contracts, it drives its blood into *g*, the *ventricle*, which, in its turn, forces it onward again into the arch, or the *aorta*, the main pipe, where it glides along in the direction of the arrow, dividing into smaller streams on its way, and finally goes down the *descending aorta h*, to supply the body below.

"There are many animals which have only the right heart, but none that possess the *left one* alone."

Some few animals have only one heart, which performs the office of the double heart in man. Others have two hearts lying beside each other, and perform the office of the double heart. Some of the reptiles have no heart, but they have a central artery and vein, through which the blood circulates. The heart of man is placed in the left side of the chest, resting upon the diaphragm, the base of which is beneath the second and third ribs, where they join the sternum. The apex of the heart strikes against the sixth rib.

The following is a good diaphragm of the double circulation of man and animals.

Fig. 60.



T. the trachea ; S, S, S, the bronchial tubes X, X, air vesicles in which the bronchi terminates ; *a*, *a*, *a*, *a*, systemic veins through which the impure blood is returned to the right auricle ; *b*, *c*, represents the right ventricle, *d*, *d*, *d*, right and left pulmonary arteries, *e*, *e*, *e*, pulmonary veins through which the pure blood is returned from the lungs to *f*, the left auricle, and *g*, the left ventricle, A. the aorta through which the blood is carried from the left ventricle ; *h*, *h*, and *i*, *i*, branches of the aorta through which the arterial blood is carried to the system. The pulmonary arteries empty themselves into the pulmonary veins, and the aorta and its branches empty themselves into the systemic veins.

The heart of man weighs about nine ounces, but varies in size in different persons. This organ is surround-

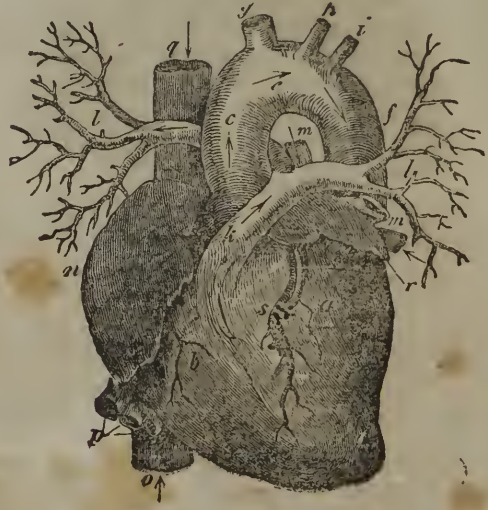
Fig. 61.

"*a, the heart*, in its natural position, the sternum being taken away, and the pericardium laid open in front, to give a full and perfect view of the organ; *c* is the arch of the aorta, or primative artery of the body, from which all others arise; *e*, is the *diaphragmatic nerve*, having its origin high up, on the side of the neck, and traveling down into the chest, on the outside of the *pericardium*, or heart-case, to reach the diaphragm, the partition that divides the chest from the abdomen. If this nerve is divided, all motion in the diaphragm will cease. It should be recollected that it is a muscle of respiration, rising and falling with the inflation and collapse of the lungs. The base, or rather under side of the heart, as it is suspended from above, rests on the diaphragm at the lower *b*; *b*, *b*, *i*, the heart-case; *d*, the *descending cava*, or great vein that returns the blood from the head and arms, into the right auricle of the heart."

ed by a membranous sack, called the pericardium, or heart case. This is attached to the base of the heart. Upon opening it, there is usually found about a tea spoonful of watery fluid.

The heart of man, like that of the beef, is a muscular organ, composed of fibres running in different directions. The one side of the heart of the beef is found thicker than the other, it is so in man. The right, or thin side, receives the dark, or venous blood and chyle, and transmits them to the lungs only. The other, or left side of the heart, takes it from the lungs and impels it through the system. The distance from the heart to the lungs is small, compared with the distance from the heart to the extremes of the system. The thickness of the two sides is proportioned to the distance the blood has to traverse from the two compartments. Each side of the heart is separated into two divisions, the auricle and ventricle. The former is called, by butchers and farmers, the deaf ear; the latter, the heart. The auricle is much thinner than the ventricle, as the blood is only passed from it into the ventricle.

Fig. 62.



"The double heart of man: *q*, *descending vena cava*; *o*, ascending *vena cava*; *n*, *right auricle*; *b*, right *ventricle*; *k*, *pulmonary artery*; *l*, *l*, *right* and *left* branches of this artery, going to the lungs on either side of the chest;

m, m, veins of the *lungs*, which return what the artery sent in, to *r*, the *left auricle; a*, the *left ventricle; c, e, f, aorta*, or great artery of the body, rising out of the left heart; *g, arteria innominata; h*, the *subclavian artery*, going to the left arm; *i*, the *carotid artery*, which goes up the side of the neck to the head.

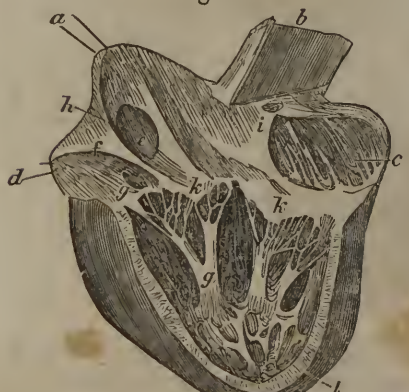
"*Note.* The arrows show the course the blood moves in each of the vessels demonstrated with the heart; *n*, the right auricle; *m, m*, veins of the lungs; *s*, left coronary artery. *p*, veins returning blood from the liver and bowels.

"There is no essential difference in the external appearance or internal organization of the heart of man and breathing animals generally; hence, in a cabinet, it would be exceedingly difficult for a practical anatomist to designate the human from the heart of a brute, provided they were of equal dimensions.

"Nothing is easier than to fill a heart with wax, or even plaster paris, in order to exhibit, distinctly, all its vessels, and its exact shape in a state of distension. The heart of any of the domestic animals, procured at the market, may bo thus filled and kept for many years."

The inside of the heart of man, as well as of animals, presents an irregular appearance like pillars or columns, named the columna carnea, or the fleshy columns. To these pillars are attached small tendinous cords, or threads, that run from them to some membranous folds, called valves. Those in the right side of the heart are called tricuspid, and those in the left side are named mitral valves. They are situated between the auricles and ventricles, and open and permit the blood to flow from the auricles to the ventricles. The contraction of the former is simultaneous with the dilation of the latter.

Fig. 63.



RIGHT SIDE OF THE HEART.

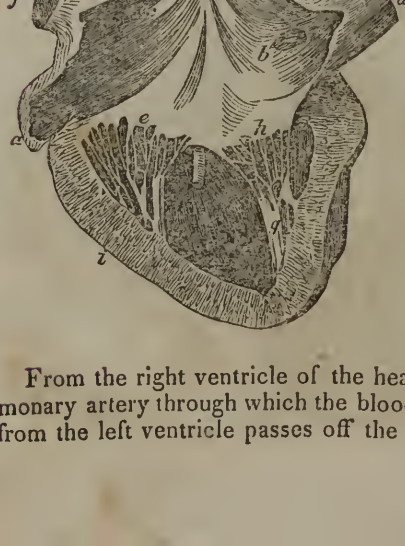
b, superior vena cava; *a, d*, orifice of the inferior vena cava; *c*, fossa ovalis; *l*, the thin walls of the ventricle; *g, g*, columna cornea, or fleshy pillar; *k, k*, the cuspid valve; *h, f*, Eustachian valve.

The auricle and ventricle are here represented as laid open.

Fig. 64.

This figure represents the pulmonary artery and right ventricle laid open, bringing to view the semilunar valves of the artery. *a*, pulmonary artery; *b*, walls of ventricle; *c*, *c*, *c*, similunar valves at the commencement of the artery.

Fig. 65.



LEFT SIDE OF THE HEART.

This figure represents the left auricle laid open. *a*, *f*, *d*, represent the veins through which the blood is returned from the lungs; *i*, walls of left ventricle; *e*, *h*, mitral valves between the left auricle and ventricle; *g*, fleshy pillars, called calumna carnea.

From the right ventricle of the heart, passes the pulmonary artery through which the blood flows to the lungs e from the left ventricle passes off the large artery of th

Fig. 66.

This figure represents the position of the semilunar valves at the commencement of the aorta; *a*, the aorta; *b*, walls of left ventricle laid open; *c*, *c*, *c*, the similunar valves of the aorta.

system, named the aorta; through this, all the red, or purified blood of the system passes. By the contraction of each ventricle, the blood is forced into the appropriate vessels, viz.: aorta and pulmonary artery; when the ventricles have forced the blood out of them, they dilate to receive a fresh supply from the auricles. To prevent the blood from passing back into its ventricle, by the contraction of the coats of the arteries, there are placed three valves at the commencement of each artery, that open and permit the blood to flow from the ventricle into the artery: but when a retrograde action of the blood commences, they close, and prevent its return to the heart.

Thus we find four sets of valves in this organ, acting like the valves of a pump, permitting the blood to flow in one direction, but preventing its reflow. In the earliest months of existence, there is an opening between the two auricles, and between the artery that passes to the lungs and the one going to the system. They are usually closed at birth, but sometimes they remain open, causing the disease named cyanosis, or blue disease. This is an incurable disease. The child usually dies young.

GENERAL VENOUS SYSTEM.

Fig. 67.

The dark or venous blood, by the action of a thousand small veins, is collected into two large veins, called vena cava ascending and vena cava descending, which open into the auricle of the right side of the heart. The blood flows more sluggish through the veins than in the arteries. They are more capacious, but no more blood passes through them. The coats also are not so thick as those of the arteries.

Upon the inside of the veins are seen valves or folds; these present no obstacle to the flow of blood towards the heart, but when any foreign influence shall cause a retrograde motion of the blood, they become tense and are thrown across the canal of the vein, presenting a barrier to the reflux of the blood. The large arterial trunks, as well as the veins, lie under the muscles and between them.

Fig. 68.

In this figure is seen represented a vein laid open to shew the valves; *a*, the trunk of the vein; *b*, *b*, valves; *c*, branch of vein entering it.

GENERAL ARTERIAL SYSTEM.

The arteries are hollow tubes, having dense elastic coats, through which the blood is conveyed to every part of the system. From the main trunk there are given off numerous small branches, by means of which the different organs are supplied with blood. The small branches terminate in a separate system of minute vessels named capillaries. This set of small vessels is interspersed between the extremities of the arteries and the commencement of the veins at the minute extremities. The blood passes through these, from the arteries to the veins. In its passage from one set of vessels to the other, it loses its red color, and becomes dark.

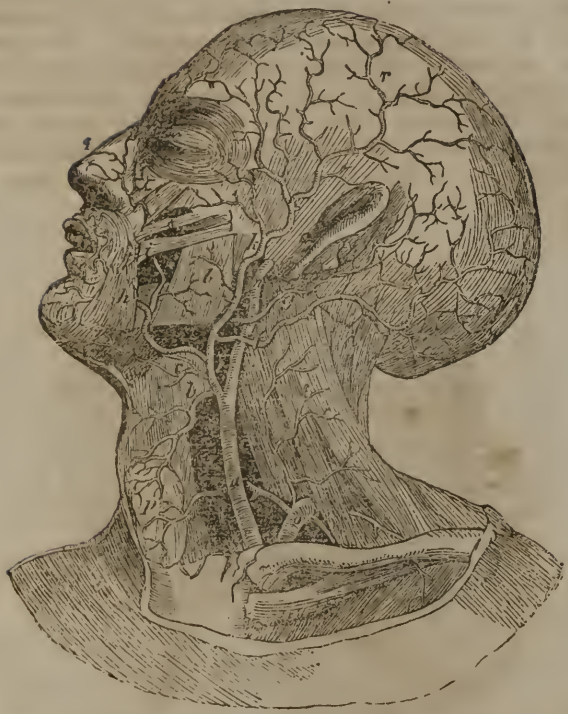
The blood is carried from the heart, through the arteries, by the contractile power of the heart, the contraction of the arterial coats, and by the influence of the muscles upon the arteries.

Fig. 69.

The contractile power of the human heart has been estimated by different physiologists from 8, to 180,000 lbs. Its power varies in different individuals. It is the contraction of the heart, that causes the pulse at the wrist, and also the jets or irregular flow of blood from large arteries when divided. The tonic contractile power of the arteries, depend upon the thickness and health of their coats. The action of the muscles upon the circulation, is by the pressure of the hardened, contracted central part of the muscles upon the arterial tubes. The amount of the influence willdepend upon the energy of the muscular contraction. The more energetic the contraction, the more rapid and vigorous the circulation. The power that moves the blood through the veins, is similar to that of the arteries, with the exception of the expulsive power of the heart. The dilitation of the veins is of an active character, causing a vacuum ; there is a suction power that attracts the blood to them.

The time it takes the blood to circulate to the extremities of the system and return, is dependent on many circumstances. 1. Its quantity. 2. The frequency of the

Fig. 70.



By referring to the plan of the perfect double heart, *i*, shows the origin of the *carotid artery*, a branch from the arch of the *aorta*. In this very accurate plan of the superficial arteries of the head, *a*, is the continued trunk of the *carotid artery:* it is this vessel which is usually divided in suicides; it is this vessel also, with its mate on the other side of the neck, which, when compressed, causes apoplexy and death. *f*, the *occipital artery*, going to the muscles on the back of the head; *b*, is the *larynx*, or vocal box; *c*, indicates the place where the carotid divides into the *n*, the *external carotid*, branching outward; *b*, also, is the *superior* thyroid artery; *p*, the thyroid gland, and inferior thyroid artery; *k*, the temporal artery, felt beating in the temple, and sometimes selected to bleed from, in desperate cases; *o*, the left *subclavian artery;* *l*, the masseter muscle; *h*, depressor anguli oris, having running under it the external *maxillary* artery; *i*, the zygomaticus major, directing the eye also to the *coronary artery of the lips;* *q*, the nasal artery; *r*, the termination of the temporal artery, in minute twigs on the top of the head."

contraction of the heart. 3. The energy or power of the heart. 4. The size of the person. As it is by the

circulation of arterial blood that each organ is supplied with nutrient material, it is of importance that it be equalized, and that each organ be duly supplied. To effect this, all parts of the system must be properly and equally supplied with clothing; this is necessary to maintain an equal temperature. The thin dressing sometimes seen upon the feet, and the upper part of the chest, does not coincide with the amount of clothing upon other parts of

Fig. 71.

"This diagram may be regarded as perfectly true to nature. The design is to show how the blood is conveyed to deep-seated muscles of the face, and to the membranes covering the brain, within the skull: all the vessels now under the eye are branches, originating from the trunk of the external carotid artery, shown in the preceding plan. *a*, is the *middle* or great *meningeal artery of the dura mater*. By the side of the ear, lies the trunk of the *internal maxillary* artery, supplying a vast quantity of blood to the muscles of the face; part of the jaw and the process of the temporal bone is removed, to explain the manner of its course under and about them. *b*, a branch of the *inferior maxillary artery*, seen in the other plan; *c*, *posterior temporal branch*; *d*, *pterygoid arteries*, supplying those muscles which move the jaw in chewing; *i*, *buccal artery*, going to the buccinator, or trumpeter's muscle; *f*, *anterior deep temporal* branch; *e*, *infra oribitar artery*.

The bone in this figure is supposed to have been taken away, in order to exhibit the arteries *a*, which branch, like the limbs of a tree, over the surface of the dura mater.

the body, and the feebler the system and circulation, the more injurious the practice. Persons in ill health usually have cold extremities, and a pale, dry skin. Health can never be considered regained, until this state of the skin and extremities is removed; which can be done by suitable clothing, by exercising the muscles of the system, by judicious labor, bathing, and other conditions referred to in preceding sections. Bands and ligatures, when they compress the arteries and veins, are extremely pernicious. In no case should cords or belts, be worn so tight as to impede the circulation of the blood. A ligament put around the arm by the surgeon, when he wishes to bleed from the arm, causes the veins to become fuller and swollen. The same in true, applied to any part of the system. This fulness of the veins is followed by knotty-like swellings, which are called varicose veins of the limbs. These veins are not unfrequently the cause of ulcers. If the veins of the limb become full and permanently swollen, a surgeon should be consulted, that the cause be removed and suffering averted.

BRONCHITIS.

Tight dressing about the neck makes pressure upon the veins, the blood being prevented from freely returning to the heart. The effects resulting from such practices and habits, are a full and swollen face, its livid hue presenting an unnatural appearance. The veins of the brain are congested, and filled with a redundancy of blood, which leads to a disease of this important organ. This tight dressing about the neck is one of the fruitful causes of the loss of voice, or bronchitis, among public speakers. This is a disease of the larynx, or upper part of the windpipe; the vessels at this point are weakened. To prevent this trouble, dress the neck loosely, permit the veins to return their blood freely to the heart. This disease is rarely seen in females, and never among teamsters, and others who dress their necks loosely. When the vessels become congested, induce a contractile power in them by friction, cold bathing, moderate and judicious use of the organs of the throat.

Fig. 72.

"This figure has been introduced to show the manner of supplying the brain with arterial blood by the *vertebral* arteries. It will doubtless be recollected by the critical student, that in the lateral arms of the vertebræ of the neck, there were round holes, from one bone to the other. Through those holes an artery creeps securely into the skull, unexposed to the thousand accidents to which the carotid arteries are liable. If, for example, an operation requires that the carotides should be tied, so that no blood can pass in them, a supply for the brain is secured by these vertebrals. When they have arrived within the skull, at the under side of the brain, the two marked *b*, *b*, unite into one, which is *c*, and then branches off among the convolutions of the brain, indicated by the various letters; *g*. is the little brain or *cerebellum*; *f*, the middle lobe of the brain, or *cerebrum*; *e*, the anterior lobe of the *cerebrum*; and *a*, the *optic nerves*, or nerves of vision. This is no fanciful distribution of the arteries of this organ, but a perfectly true representation."

DISEASES OF THE HEART.

These are various; and attending them the action of the heart is usually irregular. The walls of either cavity of the heart may be thickened. This is called hypertrophy. They may become thinner. This is called dilitation. The valves may be destroyed. This is called valval disease. The heart may sympathize with the brain, lungs, or stomach, which may induce an irregular action of this organ. Such being the uncertainty of the causes of disease of this organ and its condition, we advise all persons having symptoms of disease of the heart to consult a good physician.

Fig. 73.

"What is seen in this drawing exists in every living arm. Over the bend of the elbow, a mere web lies between the great artery and the vein. The vein is taken away, but it will show how dangerous it is to bleed the vein at this point, on account of the nearness of the artery, which is liable to be wounded by the point of the lancet. A knowledge of this fact should deter every one from employing surgeons in whom they have not the most implicit confidence, that they understand anatomy. *a, b, c, d, e f. g, h, k,* mark the branches of the *brachial artery a*, as they are, in relation to the muscles; *i*, is the *fascia* or the membrane, between the *artery and vein*, and which is a tendinous strip sent off from the biceps flexor cubiti, or bending muscle of the fore-arm, as though it was expressly designed to confine the throbbing artery in its place, and protect it from the injuries to which it seems liable by carrying burdens in the arms. This strip of tendon is like the arch of a bridge, for if the arm is bent it is still tense, and therefore always a defence.

This brachial artery, near the elbow, divides into branches; one of them sinks into the muscles, to supply them, by the side of the ulna, on a line with the little finger, and hence called the *ulnar artery* The main trunk of the *brachial*, however, travels downward, quite superficially, near the edge of the *radius*, and therefore has the name of radial artery. In the wrist, being just under the skin, it is pressed against the bone, where its pulsations are felt: feeling the pulse, in the language of physicians, simply means the sensation conveyed by the throbbings of this artery, when thus compressed. Further on in the palm of the hand, it forms half a circle, termed the *palmar* arch, and from its outward curve *digital branches* convey the blood to the fingers and thumb."

STOPPING OF BLOOD.

If the *brachial* artery is severed, the blood is thrown

out in a large jet, or stream. The same results will follow if any large artery of the system is divided.

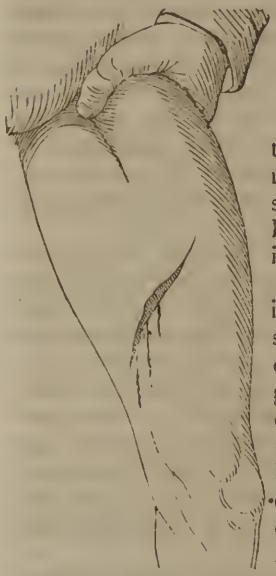
If small vessels are severed, the blood will flow out regularly and no jet will be seen. In all instances of a division of a large vessel, the person wounded or some by-stander must arrest the bleeding, or dangerous effects may follow.

This *must* be done before a surgeon is called, by making pressure upon the vessel between the heart and its division at the wound, or the pressure may be made with the finger upon the mouth of the divided vessel as seen in engraving (74,) where the finger is represented pressed into a gaping wound. This compression should be continued for some time, or until a surgeon is called. After holding the finger upon the vessel a short time, it may be removed and there may be no hemorrhage. If the jet of blood is large, indicating the division of a large vessel, a surgeon should be called to put a ligature around the artery, as bleeding will soon return. The divided arteries of the lower limbs, head, neck, and body, should be treated by compression as represented in the arm.

Fig. 74.

If no large vessels but many small ones are divided, there is no danger from excessive bleeding. In this case press the lips of the wound together and hold them a few minutes, then wash out the wound with cold water. The bleeding is stayed by the divided vessels retracting into the flesh, and their divided mouths contracting. The many things used to stop blood are of no utility. The bleeding is arrested by the contraction or retraction of the vessels as above described.

Fig. 75.



In a division of an artery of the lower extremity the hemorrhage may be arrested by pressing with the thumb or finger, the large artery at the groin, where it comes out of the abdomen.

In fig. 75, a wound is seen in which the large blood vessel is divided, and the method of compressing the artery at the groin is represented. The above described methods, are the only proper means to use in arresting bleeding when large arteries are divided. Filling the wound with different articles should not be resorted to.

TREATMENT OF "FRESH CUTS".

The small "fresh cuts," are treated by the friend that is near, as the mother, sister, father, or brother. The treatment of these, is as various as the taste and knowledge of individuals, yet all profess to believe their method to be "the best." Most pretend that their favorite application, has healing properties. Says a good old lady, "I know my salve is healing. I have put it on thousands of times, and the parts always healed." It is probably true, the parts healed, still it does not sustain the position. Many cuts have been dressed with cold water, and have healed, and many cases have healed without any application. The manner the wound *is* healed, I will point out.

The vessels of the divided part are excited to action by the stimulus of the division of the parts, or, as called

by Dr. John Hunter, "the stimulus of imperfection." The vessels thus excited, immediately throw out a colorless substance of a semi-fluid character, called lymph. It is of a fibrinous character, and coats over both lips of the wound their entire depth. This lymph which is separated from the blood, may be seen on the surface of the wound the second day; and it is the material that fills the wound and unites the divided parts. Hence we say, that the many things applied, have not in themselves any healing quality.

Treatment.—Always examine a wound, and if the blood is not thrown out by jerks, no large artery is divided. The wound may be pressed together with the fingers, and held so for a few minutes; then remove the fingers and wash the gap with cold water, and continue to wash it, by letting the water *drop* from a sponge or cloth, until the bleeding shall entirely cease, and all the blood has been removed. Then bring the parts together, and retain them by narrow strips of adhesive or resinous plaster. These should be put on smoothly. Cover the plaster with a fold of cloth, and put a bandage loosely around the part.

The following engraving represents the manner these strips of plaster are held and applied to the wound.

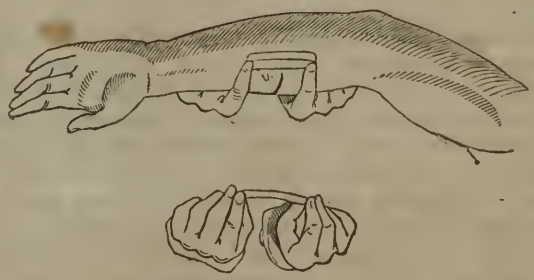


Fig. 76.

In most instances in domestic practice, the strips of adhesive plaster used to dress wounds are much too wide. In all instances, let the cloth be smoothly covered with

the plaster. Cut it into narrow strips, not more than one fourth of an inch wide; apply a sufficient number of these strips to cover the wound. The following engraving represents the manner of cutting these strips.

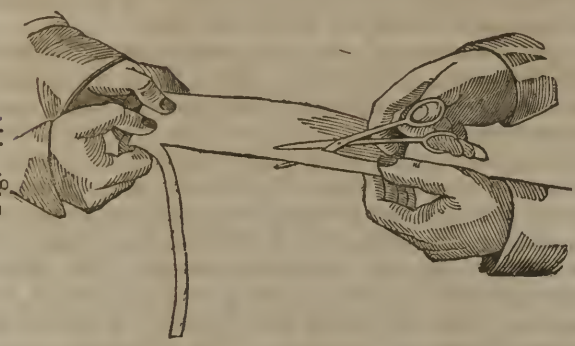


Fig. 77.

In a simple wound dressed in this way, the dressing need not be moved for *five* or *six* days; when they are moved, the parts may be cleansed by washing with weak soap suds, or warm water, and if needed, fresh strips of adhesive plaster may be applied. In removing the dressing from a wound, remember to raise each end of the strip of plaster and draw it toward the wound. This is important, as the liability of the wound re-opening is diminished. The following engraving represents the manner of removing the strips of adhesive plaster.

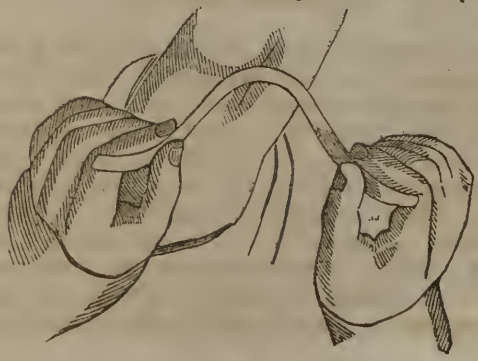


Fig. 78.

The adhesive strips bring the parts together, and diminish the gap. Again, these strips keep the air and other foreign substances from the wound. Every family should have the adhesive or resinous plaster ready to spread and apply to the ordinary "cuts," as the expense for two ounces would not exceed 12 cents.

Upon the matter of dressing wounds, there is a great want of correct information. Many things are advised and applied. One will apply black pepper, others camphorated spirits. Those who chew tobacco, think that a sovereign balm, and consequently a tobacco cud is crowded into the wound. Major W——, the able and distinguished engineer, was present when a laborer engaged in one of the coffer dams used in erecting the bridge over the Connecticut river, received a wound. The Major forthwith filled his mouth with an extra supply of the weed, and filled the wound with the saliva, bound it up, and sent the man to a surgeon. This gentleman, an understanding and intelligent man, made this application with the best of intentions; he had probably seen it used, and applied it without thought. Surgeons find this remedy used in every section of the country. In wounds of animals, as well as in the human race, salt, rum, vinegar, and other "healing" and "cooling," applications, as they are called, are applied, and in all cases they are highly irritating and injurious.

LACERATED WOUNDS.

In torn or ragged wounds, there is not so much bleeding, as in cuts with sharp instruments. The vitality or life of the part is diminished, and they do not unite so speedily. The treatment of such wounds is somewhat different from that of cuts. Wash the wound with water, bring the parts together and retain them by adhesive plaster. In some instances, the application of the emollient poultice will be called for, to allay nervous irritation, and to induce the formation of matter. In some instances the blood-vessels may be injured, and do not bleed immediately, but will give trouble in a few hours

or days. Prudence and economy require, that these cases be examined by the eye of the understanding surgeon.

PUNCTURED WOUNDS.

When injuries are made by sharp pointed instruments, the wound is usually deep, penetrating deeply into the limb, cutting first the skin, then the muscles, and severing the arteries, veins, and nerves. The several vessels bleed, and the blood does not escape, but is kept pressing and irritating the parts. Such wounds are most dangerous. An emollient poultice, made of ground slippery elm bark, linseed meal, or crackers and milk, boiled together, would alleviate the pain. In all cases of severe wounds, the food should be moderate in quantity, and unstimulating ; and if the person has been accustomed to active exercise, the food should be diminished in amount.

POSITION OF LIMBS IN DRESSING WOUNDS.

The position of the limb will favor the closing of the wound. If the wound be upon the anterior and inner part of the arm between the shoulder and elbow, bending the elbow will favor the closing of the wound, see Fig. 76. If the wound be upon the back of the arm, between the shoulder and elbow, by keeping the arm extended the wound will be closed, see Fig. 76 *a*.

If the wound be upon the anterior part of the arm between the elbow and wrist, bend both elbow and wrist. See 76 *b*. If a wound be upon the anterior part of the thigh, by bending the thigh upon the body and extending the knee, the wound will be closed. If the wound be upon the back part of the thigh, by extending the thigh upon the body, and flexing the knee, it will favor its closing. If the wound be upon the anterior part of the leg, between the knee and ankle, by extending the knee and flexing the ankle, it will aid its closing. In wounds upon the back part of the leg between the ankle and knee by extending the foot and bending the knee the gaping of the

wound will be diminished. In wounds upon the anterior part of the trunk of the body, by keeping the body flexed. In wounds upon the back part of the trunk by keeping the body straight, the union of such wound will be aided.

ENLARGEMENT OF THE VEINS.

These are by no means uncommon. They are called varicose veins, and are frequently attended by ulcers termed *varicose*.

Fig. 79.

Treatment.—Firm and equal compression is the only effective medication. This is easily accomplished by using a laced gaiter made of flannel or buckskin. The engraving Fig. 79, gives a good idea of this useful method of supporting the weakened veins. This method of bandaging may be used in any case demanding such support.

THE NERVOUS SYSTEM.

The nervous system is divided into three parts, for anatomical description. The brain, the medulla spinalis or spinal marrow, sometimes named the pith of the back bone, and the nerves. The brain is the central part of this system. It is surrounded by eight bones of the skull, named the cranial bones. These are arched, being convex externally and concave internally. They are covered upon the exterior with a thin, firm membrane, named the pericranium. Over this, we find a thin muscle, and the hairy scalp. Upon the inside are found three membranes. The first is called the dura

mater, which adheres strongly to the internal surface of the cranium. It has two considerable processes, one of which dips into a fissure of the brain, and divides it into two parts, called hemispheres. The arachnoid membrane is thin, semi-transparent, and in health has no vessels that are perceptible to the naked eye. The pia mater is a thin, soft membrane, abounding with vessels, and much of the blood going to the exterior of the brain passes through them. In one form of disease of the brain, these membranes are the parts diseased.

Fig. 80.

a, *a*, the scalp turned down ; *b*, *b*, *b*, the cut edge of the bones of the skull ; *c*, the external strong membrane of the brain, the *dura mater* suspended by a hook ; *d*, the left hemisphere of the brain showing its convolutions ; *e*, the superior edge of the right hemisphere ; *f*, fissure between the two hemispheres.

The brain is divided into three parts ; the cerebrum, or larger brain, the cerebellum, or smaller brain, and the medulla oblongata. The human brain is a soft pulpy mass, composed chiefly of albumen. This albumen is

a substance similar to the white of eggs. If it be macerated in rum, it is hardened like a boiled egg. This is one of the changes wrought in the brain by rum-drinking, which destroys all the finer feelings of man, acting as a slow but sure poison. The rum is carried to the brain mixed with the blood in the blood-vessels. Upon the exterior surface are seen undulating windings, named convolutions. These are found upon the upper and lateral parts of the brain. The external part of the brain is of an ash color, hence it is called the cineritious, or cortical part of the organ. The central part is named medullary, and its color is much lighter.

Fig. 81.

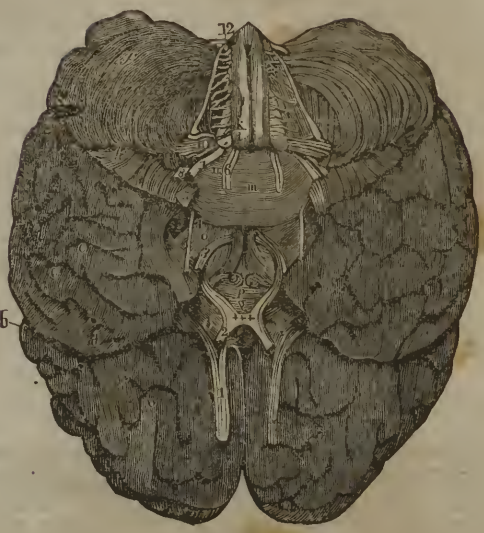
The above engraving represents a horizontal section of the bones of the skull and brain; *a*, *a*, represents outer layer, of ash colored matter; *b*, *b*, the white medullary central part of brain c, the corpus callosum.

Fig. 82.

This is an exhibition of a vertical section of the bones of the head, face and brain, showing precisely the appearance, were the head is divided in the middle from the top down to the neck. No letters of reference have been introduced, because the plate will be doubly valuable, when the general relation of the different portions have been learned from the text and the other diagrams. The reader will then trace with his eye the outline of the little brain marked *a*. In this the medullary matter is arranged in the form of the trunk and branches of a tree, hence, it is called the arbor vitæ, the *cerebrum*; or large brain is the seat of thought; the ventricles and other interesting points, which, though intricate, are nevertheless worth the trouble of understanding. The mechanical arrangement only, is contemplated in these illustrations.

The cerebellum, or little brain, belongs to the animal system, and is totally different in its functions from the cerebrum, or brain proper, which is the immediate seat of intellect. The cerebellum is situated behind and below the cerebrum. It is smooth; the matter of which it is composed presents no convolutions, but is arranged in lamina, or plates. It is separated from the larger brain by a process of the dura mater, called the tentorium. This membrane prevents the larger brain from compressing the lesser. The little brain like the larger, is composed of a cortical and medullary portion.

Fig. 83.



In the above engraving the base of the brain is divided into three lobes, marked *a*, for the anterior, *c*, for the middle, while the convolutions of the posterior lobe may be seen on each side of the cerebellum, this is marked *f*. *b*, is the depression that divides the anterior from the middle lobe, *d*. the convolutions forming an external covering for the whole of tho cerebrum, *e*, depression between the convolutions, *h*, horizontal fissure or line of separation, *i*, spiral cord, *k*, pyramidal body and *l*, the olivary body, two prominences situated at the head of the anterior columns of the spinal cord, *m*, the bridge of varolius, this bridge of whitish substance maintains and unites one half of the cerebellum with the other, and beneath which as under a bridge popes prolongation from the cerebrum, *o*, *n*, prolongation from the cerebellum to form the bridge, *p*, two small rounded eminences named from their form the mammillary, *q*, an enlargement called the tuber cinerium, 1, the olfactory nerve, * its bulb and * * its three roots. This is the nerve of smell, the bulb lies upon a bony plate just above the nose, which is pierced with many holes, through which it sends many small nerves, branches to supply the membrane lining the nose, 2, the optic nerve, * * * the meeting of the nerves from the opposite sides called the decussation or crossing of the optic nerve. This is the nerve of sight, and when divided vision is entirely destroyed, nor is there any evidence that after the nerve to all appearance has been completely restored, that the function has ever been returned, 3, 4, and 6, nerves that go to the muscles of the eye, consequently they are nerves of motion, 5, the trifacial nerve so called because about the time that it emerges from the cranium it divides into three branches, all of which are distributed to the parts about the face, one of the branches goes to the eye and is called the ophthalmic, one goes to the teeth of the upper jaw and the other goes to the teeth of the lower jaw. The two last are called the upper and lower maxillary nerves. The two first are for sensation and the last for sensation and motion, 7, the facial nerves, 8, the auditory nerve, 9, the glossa pharyngial nerve which supplies the tongue and pharynx, 10, the *vagus*

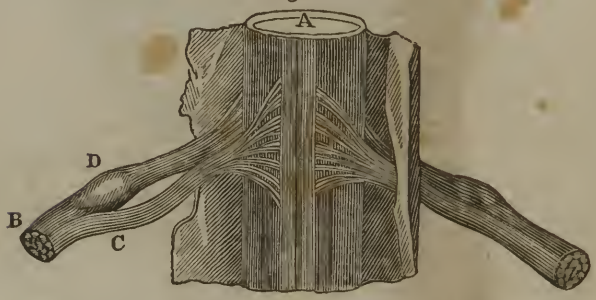
or wandering nerve which is distributed to three separate systems, the respiratory, circulatory, and the digestive, 11, the hypo glossal or nerve of motion of the tongue, 12, the spinal accessary.

Fig. 84.

a, the cerebrum, *b*, the cerebellum, *g*, the medulla ablongata, *c*, *d*, the medulla spinalis, or pith of the back bone. The brain and spine are represented divided into two halves.

The medulla spinalis, (or pith of the backbone,) is placed in a tube, or canal, formed by a curious arrangement of the projections of the vertebral bones. This part is surrounded by a strong membrane, called its sheath, that gives additional protection to the spinal marrow. The medulla spinalis does not fill the canal in which it is placed, but it is surrounded by a fluid, called the cerebro spinal fluid. It is largest in the neck, and loins; the middle of the back being much the smallest. It is also divided into two halves, each half is divided into two parts, or columns, of matter. From the anterior and posterior columns of matter on each side, there arises many threads, or filaments of nervous matter.

Fig. 85.

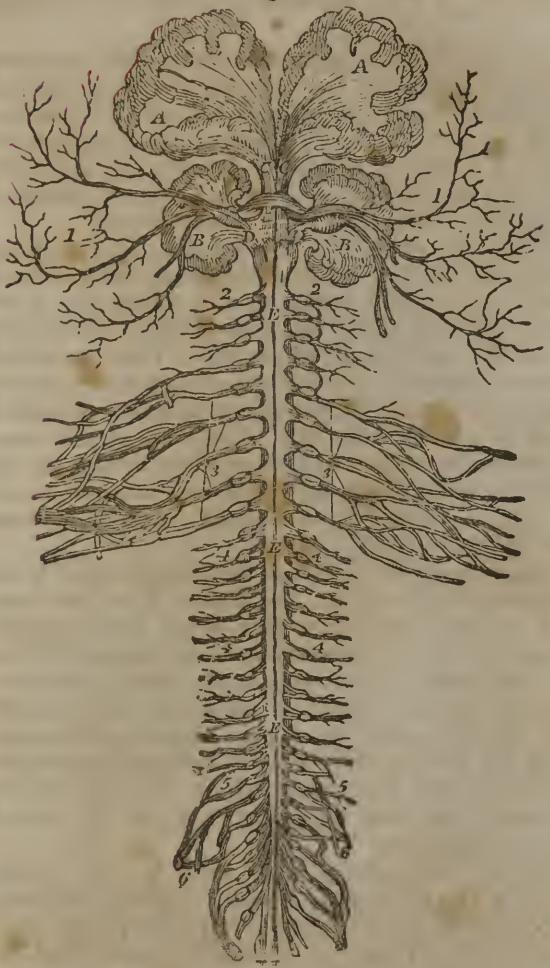


A, spinal cord. B, spinal nerve. C, motive branch of the spinal nerve. D, ganglion of the posterior branch of spinal nerve.

Some of the two series of filaments unite to form a cord that is named a nerve. The filament coming from the posterior root is one of sensation. The one coming from the anterior root is one of motion; the offices of the two are different. The anterior filament contributing to the contraction of the muscular fibres, while the posterior imparts sensation to the different parts of the system.

There are twenty-nine pairs of nerves, of sensation and motion, passing from the spinal marrow to the different parts of the system. These pass out at the foramina, or brakes in the sides of the vertebræ. If the anterior root be divided, sensation alone will remain in the part

Fig. 86.



A, A, Cerebrum, or brain. B, B, Cerebellum, or little brain. C, C, Crura cerebri, or union of the fibres of the brain. D, D, Crura cerebelli, union of the two sides of the little brain E, E, E, Spinal Marrow. 1, 1, Branches of the 5th nerve, so often noticed in this work. 2, 2, Branches of the sub-occipital nerves. 3, 3, Branches of the four inferor cervical nerves and the first dorsal,

forming the axillary plexus, from whence all the nerves of the arm and fingers have their origin. 4, 4 4, 4, Branches of the dorsal nerves. 5, 5, Lumbar nerves. 6, 6, Sacral nerves.

supplied with filaments from this nerve, but no motion can be produced. In some instances the diseased part has no feeling, but it can be moved freely. In such instances the posterior root is affected, while the anterior remains in a state of integrity. By this we learn that each nerve has enclosed in its neurilema, or sheath, a sensitive and motive filament of nervous matter.

At the upper part of the spinal marrow, between the anterior and posterior columns, there is a minute tract of nervous matter; from which a set of nerves pass to the muscles which elevate the ribs in respiration; and likewise they are distributed to the diaphragm. These are called respiratory nerves. By the arrangement and provision of this set of nerves, the function of respiration is placed beyond the control of the will. Thus we cannot commit suicide by willing that we will not breathe, as we otherwise might if the respirating muscles received nerves only from the anterior and posterior tract of nervous matter before described.

The nerves of the upper part of the spine, pass to the muscles of the face, lips, and neck. From the lower part of the neck and upper part of the spine, several large nerves are sent to the arms, hands, and skin. This part of the system is more abundantly supplied with nervous cords than any other. Twelve pairs issue from the twelve dorsal vertebra, which pass along the lower edge of each rib, and are distributed to the muscles that pass between and over these ribs. From the loins several large nerves pass down the anterior and posterior part of the lower extremities.

Upon each side of the spine there is seen several nodules of pulpy nervous matter, termed ganglions. These ganglions are connected with each other by small nervous cords. They are likewise connected with the cerebro spinal system of nerves, described as issuing from the spine. This system of nerves is named the sympathetic or ganglionic. From the main centre of

Fig. 87.

MUSCLES.

A, Pectoral muscle. B, Deltoid muscle. C, Lastissimus dorsi muscle. D, Serratus major anticus muscle. E, Biceps flexor brachii. F, Round tendon of the biceps, crossing the elbow joint. G, The broad expansion of the biceps, shooting into the fascia of the fore-arm. H, Triceps extensor muscle. I, Brachius internus muscle, an auxiliary to the biceps. K, Coraco brachialis muscle, an assistant to the deltoides. L, Supinator brevis muscle, turns the palm of the hand and fore-arm forward. M, Supinator longus, operates in unison with the brevis. N, Extensor radialis longior, extends the fore-arm. O, Many flexor muscles of the fingers, all arising from one point. P, Flexor digitorum profundus, bends the joint of the fingers. R, Annular ligament of

the wrist, bending the tendons in a groove. S, Short muscles, forming the ball of the thumb. T, Flexor and abductor muscles of the little finger.

NERVES.

1, 1, Radial nerve. 2, 2, Ulnar nerve. 3, External cutaneous nerve. 4, Muscular spiral nerve; supplies the flesh on the back side of the arm and skin. 5, A communicating twig. 6, Articular nerve, round the joint. 7, Internal cutaneous, supplies the skin under side of the arm. 8, External cutaneous, again; passing through a muscle, and then becoming a cutaneous nerve. 9, Branch of the external, going to the back of the thumb. 10, Muscular spiral nerve. 11, A branch of the external cutaneous. 12, The radial nerve. 13, The ulnar nerve. (Different views.) 14, A branch of the ulna, to the back of the hand. 15, Distribution of the radial nerve to the thumb, fore-finger, middle and one side of the ring finger. 16, Distribution of the ulna nerve to the other side of the ring, and both sides of the little finger.

N. B. We have exhibited in this plate a mass of muscles and nerves, that the reader may have some idea of the complex machinery necessary to the perfection of one single limb."

Fig. 88.

2, The *optic nerve*, the nerve of vision, second in the order, 3, *Motor Oculi* or third pair arising from the brain. 4, *Trachlearis* or fourth pair. 5, *Trigemini* or trifacial with the three great branches spoken of before A, First division of the fifth nerve called the *ophthalmic branch* which divides again into B, the frontal nerve. C, The lachrymal nerve. D, The nasal nerve. E, Second division of the fifth nerve. F, That branch of it going to the teeth and skin of the upper jaw. G, a ganglion. H, Branches going to the palate and throat. I, Vidian nerve. 6, Sixth nerve of the brain. K, Organ of the *great sympathetic nerve*. L, Its additional branch from the vidion nerve. M, Branch of the fifth nerve going to the tongue. This is the nerve of motion.

this system, which is immediately behind the stomach, there passes off a multitude of small nervous filaments, that surround and accompany all the arteries that meander through the system. These minute nervous fibres exercise an important influence upon the vital organs, as the lungs, heart, and stomach. Every artery of the system, if no larger than the smallest hair, is supplied with nerves. By the arrangement of these nerves, and

Fig. 89.

A, A, A, A, semilunar ganglion and solar plexus; B, small splanchnic nerve; C, great splenchnic nerve; D, D, D, thoracic ganglia, 10 or 11 in

number ; E, internal branches ; F, external branches attached upon the bodies of the vertabra ; G, right coronary plexus ; H, left coronary plexus ; I, superior cervical ganglion ; J, inferior twigs ; K, external threads very slender ; L, internal twigs very minute ; M, anterior thread ; N, Middle cervical ganglion ; O, interior twigs ; P, external twigs ; Q, superior cervical ganglion ; R, superior branches ; S, inferior branches ; T, external branch ; U, submaxillary ganglion ; V, vidian nerve ; W, naso palatine branch ; X, spheno palatine ganglion ; Z, auditory nerve and membrane of the tympanum, containing within its cavity, four small bones of the ear. 1, renal plexus, 2 2, lumbar ganglia, 3, internal branches, 4, external branches, 5, aortic plexus.

those that come directly from the brain and spinal marrow, a mutual dependence is preserved among all the various portions of the animal frame.

The conditions to be observed, for the development, health, and the proper discharge of the functions of the brain and nerves, will now be the subject of brief practical inquiry. In pursuing this inquiry, I shall regard the brain, as the organ through which the mind acts. If this be true, the energies of the mind will depend somewhat upon the state of the material organ, the brain. I shall not enter here on the question, whether the brain is an aggregate of parts, performing separate and distinct acts. This important question has been ably discussed by writers of great talent. To them I refer the inquirer. There may be distinct organs in the brain, and yet we may be unable to locate these organs, map them out, and describe their boundaries. That the mind acts through the brain, and that its vigor of action depends upon certain conditions of the brain, is illustrated in the child. While the cerebral organ is undeveloped, the mental powers are feeble ; but, as the brain attains maturity, its mental vigor advances. The same principle is illustrated in fever. The brain in this affection becomes diseased, and the mind, to use a common phrase, wanders, or is lost. This is the state called delirium ; and in such instance, as soon as the fever abates, and the brain is freed from disease, the mind is restored. The same is true in insanity. Let the deranged condition of the brain be removed, and the mental malady is remedied. In these instances we see that the mind is most distinctly influenced by the condition of the physical organ through which it acts.

ON THE HEALTH OF THE BRAIN.

The first condition upon which the vigor of the brain depends, is the perfect primary organization of the organ. If a limb is deficient in any part, from birth, the strength and action of that limb will always be more or less defective. This is also seen in the eye. If any part is wanting, or defective, there will be imperfect vision. So with the brain; if the whole of its organization, or any part of it be deficient, the defect will be manifested in the mind. A sound and perfect condition of this organ is the sine qua non to healthful mental vigor.

The defects of the brain may be hereditary, or they may be induced by injudicious training, which renders this organ unduly weak and excitable. An example of this is seen in petted and pampered children; and not unfrequently we see the same defect for which the parent is noted, transmitted to the child. If both parents have a similar organization and imperfect in some one particular, the constitution of the child will be more deeply affected, than if only one parent had the defect. For example, if both parents have a taint of insanity in their organization, the cerebral organ of the child will be more likely to suffer than if only one parent had the imperfection. This is one reason why kindred should not intermarry. Persons related by the ties of consanguinity, usually are similar in their organization. *The second condition* upon which the health, and developement of the brain depends, is exercise. If a child's brain is not called into action, it will not be so fully developed. The same results are seen in the muscles of the arm when not used. The blood vessels not being called into action, the part will be inadequately nourished. So of the brain; if it be used, more blood will be invited to the organ. This increase of blood, in moderate quantities will give nourishment to the organ, and likewise increase its bulk. The effects of this are seen when we compare the size of the cerebrum, or thinking part of the brain of the German, with the head of the Hindoo.

Wherever intelligence shoots forth in its richest luxuriance, there are found the most capacious brains. The brain of Bonaparte, in youth, was not of an unusual size, but untiring application in after years, rendered it of gigantic proportions. The same is true of Cuvier, the celebrated French naturalist.

From this we learn, that this organ is increased in size in the same manner as the muscles of the laboring man's arm, but care should be taken that the amount of exercise be in accordance with the law of the organ. Another illustration is seen in the case of a man who retires from active business; if he has no subject of thought, nothing to excite the brain, like the arm suspended in a sling, the vessels will become comparatively inactive, and the size of the organ will be diminished; also the manifestations of the brain will be shorn of their power. Thus, we notice that the heads of elderly men diminish in size, when not engaged in some active pursuit of life. In this case, the brain first contracts, and the cranial bones follow, as they adapt themselves to the size of the mass within. If inadequate action of the brain be adverse to the health of this part of the system, *care should be taken that this exercise be not excessive in a child.* This is followed by a permanent weakness, as is seen in the over exertion of the adult. Likewise if the feeble and immature brain of the child be not only called into intense action, but that action be long continued, the tendency will be to exhaust the vitality and powers of the organ. We not unfrequently see the precocious child sinking into an early grave, or the powers of the organ becoming exhausted by the long continued and inordinate action of an immature brain. When the efforts are disproportioned to the powers of the organ, they produce an irritability that disposes the organ to respond to any thing that shall induce a deranged action. If this assertion be true, the practice of keeping the brain of the young child in constant exercise in poring over its books, is injudicious; the constant action of its vessels induces a great determination of blood to this organ, and other parts of the system being inadequately supplied with this nutrient fluid, lose their

healthy tone. While the brain is thus excited, the action of the other organs of the system is depressed. The brain itself is not only impaired by this increased action, but the whole physical frame is weakened; thus, the anxious and solicitous efforts of doating parents, in many instances, tend to destroy their fondest hopes, and highest anticipations. The child is roused to undue exertion, by the promised offers of rewards; the high hope of rivalry being planted in his breast, induces him to tax the brain, disproportioned to its power.

In calling into action the brain, four rules should be observed. 1st. This organ should not be called into action when other organs of the system are in a state of excitement. The action of the brain will divert the blood and nervous fluid from the organs thus acting, and they will be found inadequate to the task imposed upon them; thus, when the stomach is called into action in digesting food, the brain should not be excited in study or profound thought, or if the brain is thrown into a state of inaction, as in sleep, the stomach will not be duly stimulated by nervous fluid. In the first instance, the energies of the brain are centered in itself, and consequently it imparts nothing to the other organs of the system. In sleep, in the second instance, as it is in a state of inaction, it generates no stimulus, and can impart none to other organs. From this, we may see the impropriety of the practice of eating large meals immediately before retiring to bed at night, or after any considerable mental or physical exertion. Those that violate this organic law, are usually incorrigible dyspeptics, nor can they recover until they refrain from mental labor, that keeps the brain in a state of excitement, sufficient to produce a state of debility in the stomach. This is one of the reasons that journies, and vacations are often found so beneficial. The advice of Dr. Twitchell, of N. H., to a gentleman of studious habits, to purchase a flock of sheep, and tend them upon the declivity of the Green Mountains, was sound and physiological.

2nd. The different organs of the system, seem to have hours when they can be used to best advantage. Thus,

at the close of day, when darkness veils the earth, the brain seems inclined to a state of inaction. This is in consequence of the windows through which it looks upon the external world being closed. Thus, the night is designed not only for inaction of the brain, but for other parts of the system. Hence, study and thought should be pursued in the morning, and earlier part of the day; this is necessary that the excited action of the vessels may subside before the hours of sleep. If, on the other hand, a different course is pursued, most persons will pass a sleepless night.

3rd. A judicious repetition of the impressions made upon the brain, is as necessary in the education of this organ, as in the training of any other organ of the system. This is an indispensable requisite, so that all the faculties of the mind may act harmoniously in grasping the subject to which the attention of the person is called. The repeated and judicious excitement of the vessels of the brain, increases the size and power of the organ, and the strength and power of the mind is elevated in the same ratio.

4th. The brain should be supplied with a proper amount of blood of a healthy character; this condition is absolutely necessary, that the mental functions be properly sustained. If the system is drained of blood to a certain extent, the functions of the organs are suspended, as is seen in the unconsciousness that persons exhibit in fainting, after bleeding. If the blood be drawn from the system beyond a certain limit, the vitality is immediately destroyed. The same is true if the blood becomes impure, as when a person inhales carbonic acid gas.

HEADACHE AND NERVOUSNESS.

It is not uncommon, to find individuals who have a sallow, cold skin, the desire for food irregular, and what is eaten productive of pain, a distressed feeling and dizziness of the head, and the nervous system easily excited. Under such circumstances, frequently, the individual seeks relief in medicine to quiet the nerves; in general, it gives

little or no relief. In such a case, what is the cause of the nervousness? We have seen that the blood is formed from the chyle. The chyle is formed from the food. To change the food into chyle, the health of the stomach must be good. The stomach, not duly acting upon the food, the chyle is defective in quality and quantity. The chyliferous basis of the blood being defective, the blood itself must be defective through all the changes which it may pass. If the brain is not stimulated by blood of a healthy quality, and proper quantity, the manifestations of it will become irregular and defective. The same effects will be produced, if a person has not a supply of food. Thus, insanity is prevalent among the ill-fed peasants of Mantua and Milan. Ship-wrecked mariners that die of starvation and exhaustion, are always found delirious as the hour of dissolution approaches. The same is seen to be true in chronic diseases of the intestines and lungs.

Treatment.—In order to remove the disease of the brain induced be inanition, food must be given to the starving mariner, and the insane Milan. This will recruit the impoverished blood. The same is true of the conditions of the nervous system, that follow and attend diseases of the stomach and bowels. The diseased condition of the organ must be removed, that the food can be taken with safety, and then the impoverished condition of the blood can be removed by a liberal allowance of food. Sometimes, we see a person extremely nervous; the digestive organs are in a tolerable state of health, but the individual works and sleeps in a vitiated air. The blood is not duly oxygenated in the lungs; it goes to the brain deficient in oxygen, and loaded with carbonic acid gas. In this case, the cerebral organ is not stimulated by blood of a proper quality. The lungs are the organs whose functions are defective, not being supplied with a sufficiency of pure air; to remedy this condition of the brain, the room must be ventilated, and exercise should be taken in the open air. The skin should be attended to, by bathing, friction, and proper clothing. Let there be moderate mental and physical exercise.

In this affection take the medicine directed under the sections, on Liver Complaint, Dyspepsia, and Costiveness.

INJURIES OF THE BRAIN.

In injuries of the brain, the symptoms are usually alarming, and all individuals should have some information for such contingencies. In general, such accidents are attended by insensibility; the skin and extremities are pale and cold, the pulse is very weak and feeble, and the circulation is much reduced in power; the respiration also, is less deep, full and complete, and is reduced in frequency.

The prevailing opinion among the people is, that the person must be bled immediately; hence, their importunity to the surgeon to open a vein, and abstract blood. What is the effect of bleeding, upon the system? It reduces the action of the heart and arteries; it also induces a paleness of the skin and coldness of the extremities. From this, we may learn that blood-letting is demanded, and should be resorted to, *only* when the action of the circulating vessels is too great, the skin hot, and the countenance flushed. In concussion of the brain, from a fall or blow upon the head, the activity of the heart is diminished, the skin and extremities are pale and cold; no blood-letting should be used until the action of the vessels of the system is reinstated, the heat and color of the skin restored; then, it is sometimes called for.

Treatment.—In the first instance, the individual should be placed in pure air, friction, and dry warmth should be applied to the palid and cold skin; this should be assiduously persevered in, until heat and color are restored to the skin and limbs, and due action of the heart and arteries has been established. Mild stimulants may be used internally, with much advantage; as the air should be kept pure, the sympathising friends should not be permitted to stand about the patient, as they vitiate the air, as explained in the sections upon the lungs, and this is of vital importance. In these cases, respiration is diminished in fre-

quency, which prevents the blood from being duly purified; add to this, air which is deprived of a part of its oxygen, and loaded with carbonic acid and animal exhalations, and the blood must be still more vitiated. The lives of many have been shortened, and the struggles of death rendered more severe, by having the room filled with anxious and sympathising friends; this will apply to other diseases beside injuries of the brain; in diseases and injuries of the brain, and in diseases generally, no visitor should be permitted to enter the room, unless he has some duty to perform.

SYNCOPE OR FAINTING AND FITS.

Syncope or fainting, should be conducted upon similar principles; in this, there is a loss of consciousness, the circulation is feeble, the skin pale and cold, and the respiration less frequent than usual. This is generally the result of impressions upon the mind, impeded movement of the ribs, or vitiated air. Too frequently, the two last exist together, as in the cases of fainting in public assemblies; in all cases, let the patient have pure air: remove the impediments to the free movement of the ribs and diaphragm, apply friction and warmth to the skin, and ever let the individual be in a recumbent position. Keep the room free of bystanders, as they vitiate the air, increasing the illness of the sufferer. Stimulants, as ammonia, camphor and water, would be good.

If the fainting or fit continues a long time send for a physician.

MANAGEMENT OF SICK ROOMS.

The management of the sick room demands some attention; ordinarily, in all acute diseases, the sick cannot take food, as the digestive organs are impaired in their functions; the air also, being more or less confined and vitiated, tends to render the blood impure. Should the disease be of the lungs, the effect upon the blood would be very much increased in consequence of the consolida-

tion of the lung; under such circumstances, much watchful care is required on the part of the physician and nurse, to manage the food so that the disease may not be increased by the nutriment introduced, or the system prostrated by its being withheld. The food should be under the guidance of the physician in each individual case. When the person is recovering from illness, the food should be given with regularity, and in quantities not so great as to oppress the stomach, and not too frequently. (See Sec. on Digestion.) The room should always be well ventilated; too much air is preferable to a diminished quantity.

If a person is very sick, company should not be admitted, for the reason that the nervous system is highly impressible, and the slightest noise affects it. This should be the governing rule in the room of the sick child, as well as the adult. Observation shows the contrary of this to be the common practice. Should we judge by the chattering, and news-telling, that is often heard in sick-rooms, we might safely conclude that the sick child was destitute of ears, or that it had an insensible brain.

The attendant physician should direct, when company is to be admitted, and when not, into the sick-room. No other individual knows so well as the physician, the condition of the sick person. The duty devolves upon him, and not on the nurse, or friends, of excluding company when injury would arise from the admission. In the matter of visiting the sick as friends, there should be no privileged class known by the physician.

FEVER.

By authors and the people, *fever* has been divided into several varieties, as the brain fever, the lung fever, the billious fever, the typhus fever, &c. In domestic, as in professional practice, three divisions are of doubtful utility. "Fever is fever," one organ may have its function more disturbed than another, yet the disease

remains essentially the same. The symptoms of fever are some chills or rigors, soon followed by heat of skin, thirst, increased frequency of pulse, with restlessness and loss of physical and mental strength.

Treatment.—At the commencement, a mild emetic, as the Ipecac, or a mild cathartic, as the Castor oil, Rhubarb, and Carbonate of Soda, or Senna and Manna, would be proper. This may be followed by some balm or sage tea. Rub the skin once in six hours with weak lye, saleratus and water, or pure water, always wiping dry and rubbing with a coarse crash towel. The bathing should be continued from day to day during the illness. After the first day, give daily some mild aperient or injective to keep the bowels open, but avoid large doses of physic.

During the first four days give no food or nourishment, but diluted drinks, as the digestive organs are so enfeebled, that food will not be changed. See that the room is kept free from company and well ventilated. This is of incalculable importance. The above is all the treatment demanded in common cases of fever. In severe cases call in a physician early.

EYE.

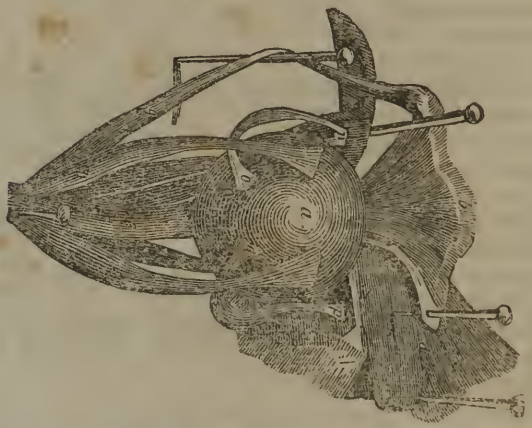
The eye is composed of the lashes and lids, the muscles that move the organ, the membranes that form the coats of its body, and the humors or fluids that distend the eye ball. The body of the organ is placed in a bony cavity called the orbit. This shields the eye from accidents.

MOTIVE MUSCLES.

The small muscles that turn the eye upward and downward, are six in number. At their posterior extremity they are attached to the bones of the orbit behind the eye. At their anterior extremity they unite to the central part of the external coat of the eye. Four of them are denominated the straight muscle, and two, the ob-

lique muscles, in consequence of their oblique movement. The internal straight muscles turn the eye inward, the external turns it out, the superior straight muscles rolls the eye up, and the inferior rolls it downward. The following engraving will give a good idea of the different muscles of the eye.

Fig. 90.



This plan exhibits the muscles, viewed obliquely from the upper and outer side of the right eye.

a, The eyeball.

b, Part of the upper eyelid.

c, ***Tunica*** conjunctiva, or continuation of the common skin of the forehead, which turns over the edges of the lids, and is finally carried over the front of the globe, but perfectly transparent at this point.

d, The integuments of the right side of the nose.

e, *e*, The optic nerve.

f, The four ***straight muscles***, with the ***levator*** or ***raising muscle*** of the upper eyelid, together with the ***superior oblique muscles***, embracing the optic nerve where it enters the orbit.

g, The levator of the lid drawn aside.

h ***Levator occuli***, or superior straight muscle, to roll the ball upward.

i. ***Abductor occuli***, rolls the ball outward.

k, ***Abductor occuli***, rolls it towards the nose

l, ***Depressor occuli***, rolls the ball downward, towards the cheek.

m, The ***superior oblique*** muscle passing through the loop at.

n, Called the ***trochlea***, or pulley, but, in fact, a simple loop.

o, Insertion of the ***superior oblique muscle***, in the eyeball.

p, The ***inferior oblique muscle***, taking its rise from a bone.

q, The insertion of the tendon of the ***inferior oblique muscle*** in the first coat of the ball.

STRABISMUS OR CROSS EYE.

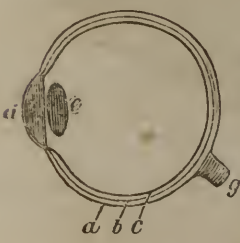
When the eye is permanently turned inward or outward, it is the squint or cross eye. If the eye is turned inward toward the nose, the internal straight muscle is shortened or contracted. If it is turned out, the external muscle is the one that is contracted. The causes of this are various; hooping cough, convulsions or fits, may cause it, inflammation of the eye and muscle may produce it, also imitating cross eyed persons, may cause it. In all cases the vision of the oblique eye is impaired. This results from the inability to direct both eyes towards an object at the same time.

Treatment. Divide the shortened muscle, by cutting down upon the eye. This is easily and safely performed. When the eyes are brought parallel, the impaired vision of the eye that had been oblique will become good.

COATS OF THE EYE.

The body of the eye is covered with three coats or membranes. They are fitted the one within another like a nest of boxes.

Fig. 91.



This figure is the plan of the coats, or as they are sometimes termed, *tunics*.

Reference should be made to this after reading the text. The natural figure of the eye, in outline, is preserved.

a, The *sclerotic*, or first hard tunic.

b, The *choroid*, or fleecy tunic.

c, The *retina*, or third and inmost tunic, which is an expansion of the optic nerve *g*, the certain seat of vision.

d, The *cornea*, or prominent transparent circle, over which the lids close in winking.

e, The *crystalline lens*, or little magnifying glass of the eye, about a quarter of an inch in diameter.

f, Is the space filled by one of the fluids of the eye, and called the *anterior chamber*.

g, The stump of the optic nerve, which is prolonged into the substance of the brain.

1st. The first coat is called the *sclerotic*. It is thick and firm, and possessing but little sensibility. Its firmness and hardness give form to the eye.

2d. The second coat is named the *choroid*. It has a dark red color, and is but little connected with the first. This tunic is a complete web of arteries

and veins ; hence its reddish hue. There is upon the inside of this membrane, a fleecy nap similar to velvet, called the *tapetum*.

3d. The third coat is called the *retina*, so called from its resemblance to a net. Nothing can be more delicate, so much so, that it cannot bear its own weight. It is an expansion of the optic nerve, the immediate seat of vision.

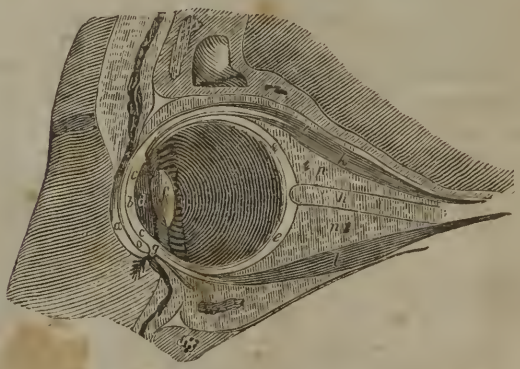
4th. At the anterior parts of the eye, there is a clear, shining wall, that resembles a watch crystal. This is called the *cornea*. It is formed of thin, transparent plates held together by a spongy elastic substance. The sparkling brilliancy of the eye is produced by an oily substance, that is continually oozing out of little glands that are lodged under the first plate.

5th. In viewing the eye, we see a vertical partition. This is called the *iris*. In color it may be black, blue or hazel. It has a central orifice, that is denominated the *pupil*. This contracts in a strong light, and dilates when the light is feeble.

HUMOURS OF THE EYE.

By humours, are meant the fluid that distends the body of the eye. They are three in number, the *aqueous*, the *crysteline* and the *vitrious*. Their situation can be learned from the following engraving.

Fig. 92.



This plan presents a longitudinal section of the left eye and orbit.

a, The upper eyelid shut.

b, The *cornea*.

c, *c*, The cut edges of the *iris*.

d, The *pupil* or round hole through the centre of the *iris*, which, in the living eye, resembles a black, highly polished dot.

e, *e*, The cut edges of the sclerotic and choroid tunics, with the retina, before exhibited in the preceding drawings.

f, The crystalline lens, as it is lodged with reference to other parts.

g, *g*, The ciliary processes continued from the choroid coat. The plaits are here distinctly seen.

h, The optic nerve, running from the brain, through the bones, to the globe of the eye, apparently closely embraced by the straight muscles.

i, The levator muscle that raises the upper eyelid.

k, The upper straight muscle of the eye.

l, Inferior straight muscle, its antagonist, on the under side of the bal called depressor oculi.

m, A section of the inferior oblique muscle, used in rolling the eye upward and inward, as in looking at a button laid above the root of the nose. The superior oblique, passing through a loop, carries the eye downward and outward, as in looking at the top of the shoulder. These two muscles, by old writers, were termed rotatores and amatores, in allusion to their office of rolling the ball in expressing passions.

n, *n*, A section of the blood-vessels and nerves, with a large quantity of fat surrounding the optic nerve.

1st. The *aqueous humor* is the first in the order of demonstration. It lies directly back of the cornea, and most of it is anterior to the iris, a small part of it lies behind the iris; thus, we learn that this curtain lies in a fluid, that keeps it moist, and prevents it, from becoming dry and shrivelling. This fluid is very clear and is frequently changed. If it is drawn away, it is reproduced in a very little time. This fluid keeps the cornea prominent, and always at a distance from the iris. In old age the amount of this humor diminishes, and the eye flattens. It is likewise less frequently changed, and becomes turbid and less transparent. This is one cause of impaired vision in old age.

2nd. The second humor is called the *crystalline lens*. It is a small body like a button, somewhat resembling pure flint glass. It is convex on both sides resembling the common sun glass. Its posterior convexity is greater, than its anterior, thereby bringing its rays to a point a little way behind it. This lens is made of a series of plates, applied to each other like the coats of an onion. The centre is firmer than the edges.

3d. Behind the aqueous and crystalline humors, we find a third named the *vitreous*. This humor is kept in its place by being lodged in cells. Like the preceding humors it is transparent, allowing the rays of light to pass.

NEAR SIGHTEDNESS.

This is produced by the crystaline lens; being too convex. This may be congenital it may be produced by disease, or by improper use of the eye, as habitually holding a book or work very near the eye. There are many more near sighted artisans and scholars, than near sighted farmers, sailors and hunters. The eye is very differently used in the two different classes.

Treatment. The only remedy to be depended upon, is the use of concave glasses.

IMPAIRED VISION IN OLD AGE.

Among old persons we see that the ball of the eye becomes flattened, and the deficient humors become less convex. The remedy for this, is the use of convex glasses. These must be adapted to the eye of the person, and the condition of the eye.

JUNICA CONJUNCTIVA OR SKIN OF THE EYE.

The skin turns over the edge of the upper eye lid, passing about three fourths of an inch back, where it strikes the ball of the eye, to which it is made fast. It it folded back upon itself, adhering to the whole anterior surface of the cornea. It dips down and mounts over the lower eye lid, then looses itself in the skin of the face. This membrane is transparent. This is the portion of the eye diseased in common inflamed, *sore* and *weak* eyes.

INFLAMMATION OF THE EYE.

Every part of the eye may become inflamed; but the conjunctiva is its common locality. The causes are various, as dust, blows, and long continued use, &c.

Treatment. Take a small portion of some laxative medicine, as the Epsom salts, rhubarb and carb. soda. Let the food be unstimulating and moderate in quantity, remain in a room faintly lighted, using the eye but little, sponge around the eye with warm water, or vinegar and water, and washing the eye with warm water, or milk and water, or a decoction of poppy leaves.

A wash of green tea is very good. The following is a good eye wash.

℞	Acetate of Lead,	20 grains.
	Sulphate of Zinc,	20 grains.
	Laudanum,	1 dram.
	Water,	1 oz.
		Mix.

This may be used once in six hours, after the acute inflammation has abated; blistering the arm or back of the neck may be of much service.

THE EAR.

The ear, that organ by which we are made sensible of the impression of sound, is a very complicated instrument, and a beautiful piece of mechanism. The appa-

ratus of hearing, is placed in a bone, called the temporal.

The following is an engraving of the temporal bone. It is situated on each side of the head.

Fig. 93.

1. The squamous or thin portion, 2, 2, the petrous portion. 3, the mastoid process behind the ear. 4, the styloid process.

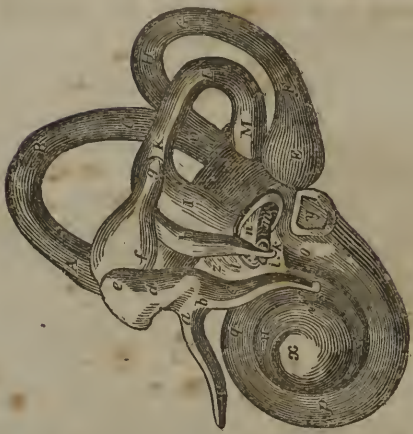
This apparatus consists of the external ear, the tube leading to the tympanum or drum of the ear, four bones, named the malleus, incus, orbiculare, and stapes.

Fig. 94.

This figure represents the four bones of the natural size. The smallest of these bones is matured at an early period of life. The smallest bone is represented magnified.

The internal ear is called the labyrinth. This consists of several tubes, called the semicircular canals, and a spinal tube resembling the shell of the snail, hence it is called the cochlea. These semicircular canals, and the cochlea contain a fluid, named the liquor cotunnis, from Cotunnius, the anatomist that first described it. In this fluid the pulp of the auditory nerve is found floating. The following engraving represents the semicircular canal, and the cochlea.

Fig. 95.

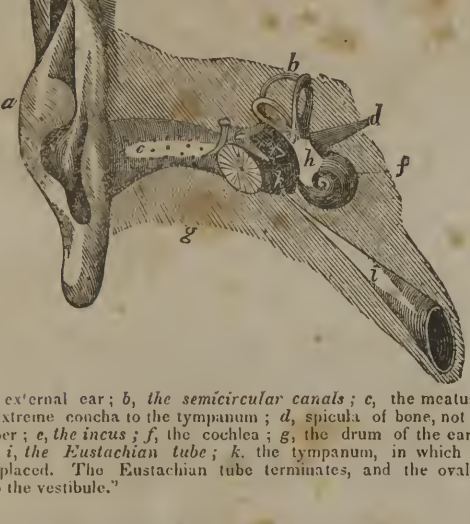


In this engraving, the semicircular canal, and cochlea are represented as divided, exhibiting the appearance of the cavity, in which the fluid of cotunnius, and auditory nerve are situated.

Fig. 96.

There passes from the back part of the nostril, to the middle ear, where the four bones are situated, a tube or canal that is named the Eustachian, from an anatomist that first described it.

Fig. 97.



"*a*, the external ear; *b*, *the semicircular canals*; *c*, the meatus, or tube from the extreme concha to the tympanum; *d*, spicula of bone, not essential to remember; *e*, *the incus*; *f*, the cochlea; *g*, the drum of the ear; *h*, the vestibule; *i*, *the Eustachian tube*; *k*, the tympanum, in which the little bones are placed. The Eustachian tube terminates, and the oval window opens into the vestibule."

Impressions are first made upon the tympanum, which is put in motion. This trembling motion induced in the drum of the ear, is communicated to the bones of the ear, as one of these bones is placed in contact with the tympanum. The last of the bones in the middle ear, named the stapes, or styrrup bone, connects with the semicircular canals. The fluid contained within these canals is put in motion, and this movement is communicated to the extreme or pulp of the auditory nerve. This impression is communicated to the brain.

Fig. 98.

1. The outer passage, about an inch in length, the lower edge being rather longer than the upper, which terminates at 2, the membrane of the *tympanum*, a Latin word signifying *drum*; 3, the *mallet*, with its handle resting against the tympanum, and its head upon 4, the *anvil*, the long narrow neck of which terminates in a rounded knob by which it is connected with the head of the *stirrup*; 5 the *window* of the vestibule closed by the stirrup; 6 the window at which terminates the ladder of the tympanum; 7 the *vestibule* with the openings of the *semicircular canals*; 8 the superior, 9 the horizontal, 10 the oblique semicircular canals; an opening has been made to show the *common* termination of the superior and oblique semicircular canals in the cavity of the tympanum; 11, 11, 11, the *ladder* of the vestibule, with its two turns and a half; 12, 12, 12, the ladder of the tympanum, with its two turns and a half; both ladders terminating in the *cupola*; 13 the internal *auditory passage*; 14, the *Eustachian tube*, by which a communication is kept up between the cavity of the tympanum, and the back part of the nostrils and mouth; 15, the *chord* of the tympanum, a nerve passing through the tympanum; 16, the *styloid process*; 17, a nerve called the *hard portion*; 18, the *mastoid process*.

IMPERFECT HEARING AND DEAFNESS.

Imperfect hearing is very common, and it results from many causes. Some of these causes can be removed, and the deafness consequent upon it relieved, and some cannot be. I will briefly name some of the

most common causes of deafness. Deafness may be produced by a thickening of the tympanum. It is the result of inflammation, usually of a chronic character. This thickening destroys the vibratory character of the drum. In such instances, relief is obtained by seeking the aid of the surgeon, and getting relief for the inflammation. Blisters behind the ears would be good for deafness produced in this way, or a weak solution of the acetate of lead. In some instances, the cerumen or wax of the ear, becomes viscid or thick, and accumulates upon the drum of the ear, destroying or impairing the resonance of the drum. This can be remedied by putting a few drops of oil into the ear, and in a few hours after injecting some warm soap suds into the ear, with a small syringe. The oil softens the viscid wax, and the injection removes it. Any kind of animal oil may be used for this purpose, and will be found as subservient as the patent oils recommended for this purpose.

The most common cause of deafness is, inflammation and swelling about the throat: this is seen in cases of scarlet fever, or canker rash, which is caused by the inflammation affecting the commencement of the Eustachian tube, behind the nostrils. Soreness of the throat, swelling or enlargement of the tonsils, is oftentimes attended with difficulty of hearing; in these cases, if the mouth and nose be closed, and a forcible effort is made to expel the air from the lungs, no air will be felt passing into the ear, as in a sound condition of the parts. The Eustachian duct in these cases, is closed. In such instances, the nostrums put into the ear, do no good; they do not reach the disordered part. Means to remove the inflammation from the throat will be of benefit; the application of such means, should be under the direction of the understanding physician. If the tonsils are enlarged, have them removed; the operation causes but little pain, and is not dangerous. Deafness may be caused by disease of the internal ear, or the brain; such cases are difficult of cure. The deafness will not be removed until the affection of the brain is removed.

DIRECTIONS

FOR PREPARING

SUITABLE DRINKS AND FOOD,

FOR THE SICK.

BARLEY WATER.

"Take of pearl barley, two ounces; water, two quarts. First wash the barley well with some cold water; then pour on about half a pint of water; boil it a little while; this water, which will be colored, must be thrown away. Bring the two quarts of water to a boiling heat, and then add the barley; continue the boiling till the whole is reduced to one quart, then strain off the liquor. This may be sweetened or seasoned as directed by the medical attendant.

TOAST WATER.

Take of wheat bread (stale) a piece, size of the hand of an adult. Place it before live coals, or near a red-hot stove-plate, till it is toasted brown on each side, taking care not to burn it.

Put the bread in a bowl, and pour over it a pint of boiling water. Cover it and let it stand till cold. Sweeten it with molasses. If lemon-juice be allowed, it should be added while the water is at boiling heat. Strain off with slight pressure, and use as a drink.

A very palatable drink may be made as above, by throwing the pulp of one or two oranges into the bowl with the toast, and then pressing out the juice when straining off the water.

GUM-ARABIC WATER.

Take of clear white gum-arabic one ounce, boiling water, one pint. Stir the gum into the water till dissolved; set it by to cool. It may be sweetened with pure sugar.

ALMOND WATER.

Take of thin-shelled sweet almonds an ounce; clear, white gum-arabic half an ounce; refined sugar one quarter of an ounce. First break the shell from the almonds, then throw them into a little boiling water to loosen the skins; remove these also. Put the blanched almonds, gum-arabic, and sugar, into a stone mortar; beat them to a fine paste. Then add gradually a pint of water. Strain off the liquor for use.

APPLE WATER.

Take one large lively apple; pare and core it; slice it into small pieces. Pour on it a pint of boiling water; let it stand in a covered vessel till cold; strain off, and add as much loaf-sugar as will be palatable.

TAMARIND WATER.

Take of tamarinds (fresh) one ounce; boiling water one pint. Put the tamarinds into a bowl, and pour on them the boiling water; allow them to stand covered until cold, then strain off with slight pressure, and add sugar, if desirable.

CREAM OF TARTAR WATER.

Take of cream of tartar one drachm; loaf-sugar one ounce; boiling water one quart. Let them stand in a white stone or porcelain vessel ten minutes, then strain off the liquor.

If the outer rind of fresh lemon or orange-peel be added with the cream of tartar and sugar, it will render it much more palatable to some persons.

OATMEAL GRUEL.

Take of oatmeal, two large spoonfuls; water, one quart. Add a small quantity of water to the oatmeal, mixing them well together till every particle of the meal is thoroughly moistened, then stir this mixture into the balance of the quart of water at boiling heat, continue the boiling for a quarter of an hour, stirring it often; strain the gruel through a seive or open cloth, and add sugar enough to make it agreeable to the taste—nutmeg or other spices to be added or omitted according to directions.

RICE GRUEL.

Take of ground rice, two ounces; cinnamon, a quarter of an ounce; water, two quarts. Boil the rice about half an hour, then put in the cinnamon, continue the boiling ten minutes longer; strain off the gruel through a sieve or cloth, sweeten it with loaf-sugar to suit the palate of the patient.

PANADO.

Take of bread, (stale) one ounce; water, one pint. Break the bread into small pieces and boil it in the water till it is perfectly soft. If spices are directed by the physician they can be added just before the boiling is completed.

SAGO.

Take of sago, one large spoonful; water, one pint. Boil gently, stirring almost constantly, till the particles are perfectly softened and separated. Strain it off through a sieve or cloth; sweeten and season with spices as directed.

SALEP.

Take of salep, (finely powdered) a tea-spoonful; water, half a pint. Mix the salep well in a small quantity of the water, gradually adding the rest till it is thoroughly diffused through it; put the whole over to boil, stirring well till it becomes like a jelly. Sugar and spices, and even wine, may be added if directed.

ARROW ROOT.

Take of powdered arrow root, one large table-spoonful; water, one pint. First mix the arrow root well into a paste with a little of the cold water; bring the balance of the pint of water to a boiling heat, then stir in the paste; let it continue to boil a few minutes, then remove it from the fire. Sweeten it with loaf-sugar, and add nutmeg, or cinnamon, or lemon-juice, if directed.

It is sometimes admissible to have the powdered arrow root beaten up with a gill of milk instead of the cold water, before it is stirred into the boiling water; of the propriety of this the physician should be the judge.

OATMEAL FLUMMERY.

Take of oatmeal (or grits) any convenient quantity; put it into a broad, deep pan; cover it over with water, stir them well together, then let them stand twelve hours; pour off the clear water, and afterwards add a larger quantity; stir up, then let them stand as before for twelve hours; repeat the same process a third time. When the oatmeal has been thus macerating about thirty-six hours and all the water poured off from it, the thick part of it is to be strained through a hair-sieve, and put into a well-tinned saucepan: this being done, let it be well stirred while it boils, till it becomes quite thick. It is then to be poured out into dishes or forms: and when cold, may be eaten with milk and sugar, wine and sugar, or cider and sugar, as prescribed.

POTATO FLUMMERY.

Take of potatoes (common or round), one pound; boil them gently in a sufficient quantity of water till they are brittle or tender: then take them out of the water and peal off the skin. Then mash them well, adding salt enough to season them; put them into a saucepan, with a quarter of a pint of milk and two ounces of butter; warm them a little, mixing them well together at the same time by beating them with a spoon till they are quite smooth. The flummery thus made, may be served up in any neat form and eaten alone, or with some bread.

RICE FLUMMERY.

Take of fresh milk, any convenient quantity; add to it a little salt, and put it over a fire to boil. As soon as the boiling commences, stir in rice flour till it is quite thick; add to this a small portion of butter and nutmeg or cinnamon, as may be directed or preferred. It is ready for use as soon as quite cold.

TAPIOCA JELLY.

Take of tapioca, one table-spoonful or half an ounce. Mix it with a pint of water, let it stand an hour; then boil it during another hour over a gentle fire, stirring it well till it is dissolved and clear. Sugar and salt, to render it palatable, may be added before it becomes cold. If lemon juice be directed, a tea-spoonful of it and a little of the peel should be put in just before the boiling is completed. The whole should then be strained off through a sieve or cloth, and a little finely grated nutmeg added.

APPLE JELLY.

Take of apples (juicy and slightly tart), any convenient number; pare, core, and slice them; then put them

into a well-tinned sauce-pan or kettle, with water enough to cover them: boil them till they are quite tender; strain the liquor through a cullender, and afterwards through a flannel bag. To one pint of the juice, add a pound of sugar and the juice of two lemons. Place them again over the fire and boil very fast, skimming off the scum till reduced to a jelly, which may then be turned out into a dish, or any fancy form. This jelly is often colored by cochineal, which is powdered and suspended in the vessel in a bag. The jelly is purer without it.

RICE JELLY.

Take of rice one quarter of a pound; sugar (white) one half of a pound; water one quart. Boil these well together, carefully stirring them, till the whole becomes a glutinous mass. Strain off by forcible pressure through a cloth, into a dish or form. When cool it is fit for use. This preparation may be flavored with rose-water, orange-flower-water, lemon-juice, &c., as may best suit the palate of the patient, or as directed by the physician.

SLIPPERY ELM JELLY.

Take of slippery elm bark (powdered or finely chipped), two ounces; water one pint. Boil these slowly, till they become a thick mass; then strain off by forcible expression into a dish or form. Sugar, lemon-juice, orange-peel, or lemon-peel, or other spices, may be added just before the boiling is completed.

ICELAND MOSS JELLY.

Take of Iceland moss (clean) two ounces; water, one quart. First wash the moss in some cold water; then put it into the quart, and boil slowly till very thick, adding white sugar till sufficiently sweet, then strain by pressure through a cloth into a dish or form. When cold it will be fit for use, and may be eaten with spices, if directed.

IRISH MOSS JELLY

May be prepared in the same way.

CALVES' FEET JELLY.

Boil two calves' feet in one gallon of water, down to a quart, then strain it, and when cold skim off all the fat; take up all the clear jelly, leaving behind the sediment, if there be any. Put the jelly into a saucepan with a pint of wine, half a pound of loaf-sugar, the juice of four lemons, the white of six or eight eggs beaten into a froth. Mix all well together. Set the saucepan upon a clear fire, and stir the jelly till it boils. When it has boiled ten minutes, pour it through a flannel bag till it runs clear. Have now ready a large China basin, with some lemon-peel in it cut as thin as possible; let the clear jelly run upon them while warm, and from these it will acquire both an amber color and an agreeable flavor. Afterwards it may be poured into glasses.

RYE MEAL MUSH.

Take of water half a pint; put it over a fire in a saucepan, and when it boils, shake into it slowly from a dredging-box rye flour, stirring well all the time till it is thick, then remove it from the fire, having dissolved in the water a sufficient quantity of salt to render it palatable.

When cool, it may be eaten with sugar, molasses, or milk, as directed.

Unless the flour is dredged into the water very slowly, and the stirring kept up almost constantly, the mush will be very lumpy and unpleasant, whereas if the above directions be attended to, it may be formed into a very palatable and pleasant article of diet.

VEGETABLE SOUP.

Take two middling-sized white potatoes, one onion (if

agreeable to the taste of the patient, or, instead of this, a turnip, carrot, or parsnep, size of a large egg), a piece of well-baked bread, size of an adult hand. Put these into a clean stew-pan in one quart of water, boil them (frequently stirring) down to a pint; throw into the vessel some parsely or celery; cover the vessel closely; remove it from the fire, and allow the herbs to steep while the liquor is cooling under cover. Toast a thin piece of bread, size of the hand, carefully, put it in the bottom of a dish, then strain off, by slight pressure, the soup from the stew-pan. Season it to the order of the physician or the palate of the patient.

CHICKEN WATER.

Take half of a middling-sized chicken, strip off the skin and fat, put it into a saucepan, with a quart of water, seasoned with a little salt; skim off any fat which may arise to the surface; remove the pan from the fire when the water has boiled thirty minutes. Strain off the liquor for use.

If spices are ordered, they should be put in a few minutes before the boiling is completed.

MUTTON WATER.

Take of loin of mutton one pound. Put it into a saucepan containing three pints of water; add a little salt; skim off the fat as it rises to the surface. Boil the meat till it is very tender, then pour off the liquor. If an onion or a little spice be allowed, they should be put in a while before the boiling is completed.

BEEF TEA.

Take of lean beef, one quarter of a pound; water, a pint and a half; salt, sufficient to season it. When it begins to boil skim it five minutes; then add a couple blades of mace; continue the boiling ten minutes longer; then pour the tea into a bowl for use.

If rice, barley, or bread crust be ordered, as an addition to either of the last three preparations, they should be boiled till they are soft before the animal substance is added.

Whenever aromatic vegetable or pot-herbs are to be added, they should be put in the vessel near the end of the process of boiling; and the vessel should then be kept covered as much as possible till the liquor is cool. No patient should be allowed to take these herbs into the stomach.

ESSENCE OF BEEF.

Take of fresh beef, cut into small pieces, one tea-cupful; salt, one tea-spoonful; mace, three blades; alspice, six whole grains; cloves, four heads; water, one tea-cupful. Put these into a clean porter bottle; bore a hole through the centre of the cork, and through this pass a quill to keep the hole open; or cut a deep notch from one side of the cork to let out the steam. Put the bottle into a kettle of water; tie up the neck of the bottle to the bale of the kettle to prevent it from dipping into the water or laying over the side of the vessel. Boil the water in which the bottle is thus suspended, one hour and a half; then draw out the cork, empty the bottle, and strain off the essence with forcible pressure through a cloth.

FLAXSEED TEA.

Take of flaxseed (whole grained), one ounce; refined sugar, one ounce and a half; lemon-juice, two ounces; boiling water, one quart. Let them stand together in an earthen vessel two hours; then strain off the liquor.

The lemon-juice, if objectionable, may be omitted; and, when desirable, an ounce of liquorice, shaved, may be used instead of the sugar.

SLIPPERY ELM TEA.

Take of slippery elm bark, shaved fine or powdered,

one ounce; boiling water, one pint. Let them stand an hour in a covered vessel; then strain. Sweeten and acidulate if ordered.

LEMONADE.

Take of the outer rind of fresh lemon-peel, one drachm; pure lemon-juice, one ounce; double refined sugar, two ounces; boiling water, a pint and a half. Let them stand together in an earthen vessel ten minutes; then strain off the liquor.

ORANGEADE.

May be made in the same way of Seville oranges—using, however, much less sugar.

CARMINATIVE TEA.

Take of Fennel seed, (bruised) one tea-spoonful; boiling water, half a pint. Let them stand in a covered vessel till cold, then strain off for use.

Coriander, carraway, or anise-seed tea may be prepared in the same way.

MILK OF ASSAFOETIDA.

Take of assafoetida, two drachms; water, half a pint. Rub the assafoetida with the water, gradually added till the whole is dissolved.

INJECTIONS.

Injections are composed of various materials, according to the effect intended by the physician to be produced. The directions for the materials and quantity to be used are therefore properly subject to his order.

To save time requisite for giving particular directions on every occasion, we have given the prescription for the preparation of those commonly used.

COMMON LAXATIVE INJECTION.

Take of molasses, two table-spoonfuls; sweet or castor oil, one table-spoonful; salt, one tea-spoonful; warm water, one pint. Mix them. To be used at the temperature of new milk.

PURGATIVE INJECTION.

Take of senna leaves, an ounce; coriander seed, (bruised,) a drachm; boiling water, one pint. Put these together in a covered vessel; let them stand an hour, then strain off, and add molasses, one table-spoonful; salt, one table-spoonful. Stir them till the salt is dissolved, and the temperature reduced to blood heat.

STARCH INJECTION.

Take of pure starch, two tea-spoonfuls; water, one pint. Mix the starch with the water, by gradually adding it in small quantities till there are no lumps; boil the whole together till a ropy fluid is formed; strain this through a cloth, and it is fit for use."

POULTICES.

"In the course of attendance upon patients, physicians not unfrequently have occasion to direct the application of poultices. These are almost always designed to exert a soothing and softening influence on the part to which they are applied, and are therefore always to be kept moist; and should be changed as often as they begin to be in the least degree dry. The edges of the poultices are too frequently spread much thinner than the centre. To prevent this, it will be proper to take a piece of thick linen or muslin, an inch longer and wider than the size intended for the poultice, on this spread the prepared materials, as nearly as possible of one thickness, to within an inch of the edges, then turn up these edges into the margin of the poultice. By this means the poultice will be kept of uniform thickness, and every part of it which is in contact with the skin can be kept equally warm and moist. A piece of thin mull-muslin, book-muslin, or something similar, may, very often, be spread over the surface of the poultice, to be applied next the skin. It is a good general rule, when poultices are to be removed, to have the new one prepared and close at hand before the other is taken off. The parts are thus kept moist, and at nearly the same temperature, a matter of much importance in all cases in which poultices are needed. When these remedies are ordered by the physician, the nurses should inquire whether he wishes them to be warm or cold, and prepare them accordingly.

BREAD POULTICE (COMMON POULTICE.)

Take of bread any quantity, put it into a vessel, and pour over it boiling water enough to cover it; continue the boiling till the bread is perfectly soft, stir it till it is

well mixed, withdraw it from the fire, and as it cools, stir into it oil or lard enough to keep it soft.

Milk has mostly been used in making this poultice, but it quickly sours in warm weather, and is more expensive, while it is less conveniently obtained than water.

INDIAN-MEAL POULTICE.

Take of Indian-meal, five parts; rye flour, one part. Mix them together, and let them fall in small quantities at a time from the hand into a little boiling water, stirring well all the time, till the mass becomes thick, then add oil or fresh lard, to keep the mass soft.

A less expensive, and equally useful poultice, may be made of rye shorts, or wheat bran, by stirring either of these into a little boiling water till quite thick, then adding oil or lard as the poultice becomes cool.

Poultices may be made of potatoes, turnips, or carrots, by removing the skin, then boiling them soft, and mashing them very well, and adding some oily substance to keep them moist, and prevent them from sticking to the skin.

The carrot poultice is sometimes made by grating the fresh root into a soft pulp, and applying it without boiling.

APPLE POULTICE.

As *rotten* apples are not always at hand, and when they are to be procured, they are generally wormy, it will be better to prepare this poultice from the ripe fresh apple; for this purpose, pare and core any convenient quantity of apples; stew them till soft; stir them while boiling, till well mixed; then spread the pulp upon the cloth, as already described, and place over it the thin muslin to be applied next the skin.

HOP POULTICE.

Take of hops, a large handful; boil them fifteen min-

utes in a pint of water in a covered vessel; strain off by forcible pressure; put the fluid again over the fire; keep it at nearly boiling heat, and thicken it with bread-crumb, Indian-meal, or wheat bran, as may be most convenient; mix a portion of lard or oil as directed in the composition of other poultices.

HOP BAG, OR HOP FOMENTATION.

Put into a muslin or thin flannel bag, size of the part to be covered, a quantity of hops, sufficient to fill it half full; sew up the mouth of this bag; put it into a basin, and pour over sufficient boiling water to cover it; let it stand fifteen minutes open to the air, that the water will admit the hand. Having the part prepared to which the fomentation is to be applied, take it out of the water, wring it half dry, and apply it to the place as warm as can be borne, or at the temperature ordered by the physician. Place another bag of the same size and kind in the fluid, keeping it hot till ready for application. Continue alternating these as often as one becomes cool and the other warm.

THE HOP PILLOW

Is prepared as above, except that the hops are merely moistened with spirits to keep them from rustling, instead of hot water.

STARCH POULTICE.

Take of starch any convenient quantity; mix it carefully with a little boiling water till it makes a stiff mass; as it cools stir in a little lard or oil.

SLIPPERY ELM POULTICE.

Take of slippery elm (in powder), any convenient quantity. Stir this gradually into a little water till it is

thick; boil it five minutes, and spread it out on the poultice rag, as before directed.

YEAST POULTICE.

Take of wheat flour, one pound; yeast, half a pint. Mix them together over a gentle heat till the mixture begins to rise; then apply them as other poultices.

MUSTARD POULTICE.

Take of flour of mustard, flaxseed meal, each an equal quantity. Mix them into a paste with water; add oil or lard to keep the poultice from sticking to the skin.

Indian-meal, wheat flour, or powdered bread will answer nearly as well as the ground flaxseed. The vinegar mostly directed, does not increase the value of the remedy.

A fine rag should be interposed between the poultice and the skin; and great care should be taken to remove the whole from the surface as soon as the skin has acquired a scarlet redness.

SPICE POULTICE, OR PLASTER.

Take of powdered allspice, cloves, cinnamon and ginger, each equal quantities; rye meal, honey, or molasses, sufficient to make an adhesive mixture. Spread it on a linen or muslin cloth, and apply it as directed.

SPICE BAG.

Take of the powdered spices directed for the spice poultice. Mix them well together in a dry vessel; put them into a bag of thin flannel size ordered; spread them out; quilt the bag lightly to keep the spices from falling into a mass; spread the bag into a dish, and pour over it sufficient quantity of hot brandy, spirits of camphor, or whiskey, to soak through the bag and make it quite moist. Apply it warm to the part directed. This is better than

the spice poultice. It can be removed or changed as often as directed.

ALUM POULTICE.

Take the whites of two eggs; a piece of alum, size of a chestnut. Put them into a saucer and stir them briskly till the white has well curdled, take out the alum which is undissolved and spread the poultice out between two folds of cambric or fine linen."

MECHANICL CURE

OF

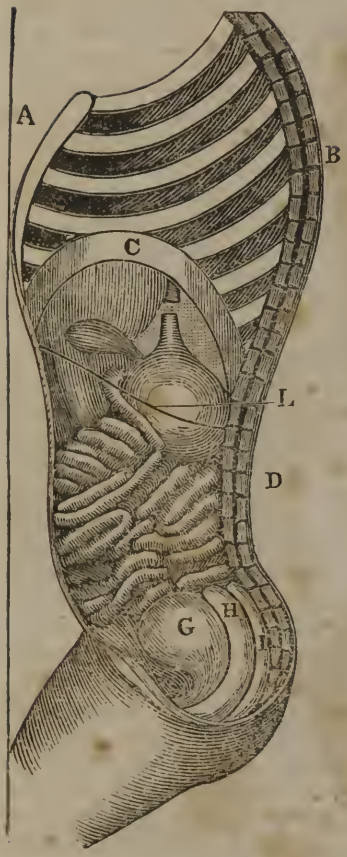
CHRONIC DISEASES.

In the community many are found, who complain of weakness, difficulty of urination or passing the water; Costiveness, sometimes attended with Diarrhœa, Piles; faintness, flatulency or wind, and sourness of the stomach; pain in the bowels, back, and in the sides, especially between the shoulders and at the lower part of the spinal column, palpitation of the heart, shortness of breath, with cough and weakness of the voice. With such conditions, we find the chest depressed or somewhat flattened, a sinking of the stomach, with a fullness or prominence of the lower part of the bowels. This condition of the system is attended with pain in the head, debility and pain in the limbs, dry, pale, sallow skin, attended with cold feet.

When the muscles or walls of the abdomen are not relaxed, as seen in Fig. 99, they support and press upward and backward, the large and small intestines. In all cases of chronic disease, when the abdominal muscles (or flesh) are relaxed they cause a weakness and protrusion of the bowels, as seen in Fig. 100, and the intestines under such circumstances are not duly supported. Consequently they press downward upon the urinary bladder, as seen at H. Fig. 100, causing a difficulty of urination and symptoms of the gravel. The Uterus also being pressed upon, sinks or falls below its natural position, causing the Prolapsus Uteri or *falling of the womb.*

The following are the symptoms of this disease. There is a sensation of sinking or fainting at the stomach, weak-

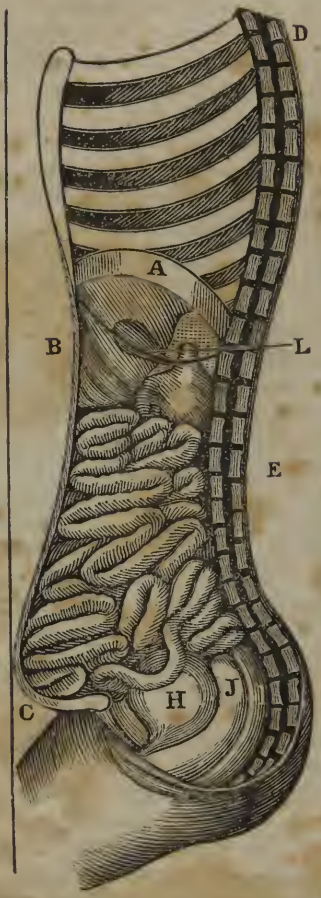
Fig. 99.



I, represents the Rectum, or lower part of the intestinal tube. H, the uterus, or womb, rising to a level with the bladder at G. B, and D, represent a section of the spinal column or back bone. C, shows the convexity and situation of the diaphragm, as it exists in the cavity of the chest, in the act of expiring or breathing out the air from the lungs. The line L, shows the plane to which the central portion of the diaphragm descends, in the act of inspiring or breathing air into the lungs.

ness and pain in the side and back, shortness of breathing, dragging pain in the lower part of the bowels, groins and back, weakness, numbness and swelling of the lower limbs, bearing down pains in the region of the womb, attended with female weakness and difficulty of urination. All these symptoms do not exist in every case of the Prolapsus, but some are found in every case. One of

Fig. 100.



I, represents the rectum. J. the uterus. H, the urinary bladder. D and E. the spinal column. A, the diaphragm, and its convexity in the centre, while exhaling air from the lungs. L, the position while inhaling the air into the lungs. B represents the chest flattened, and the stomach depressed and hollowed in. C represents the walls of the bowels relaxed; consequently they sink down and become tumid and prominent in this part. Compare this with Fig. 99.

the most certain indications that this complaint exists, is the circumstance that the woman thus troubled, is *always made worse after standing*, *walking*, *washing*, *&c.* Such patients are universally worse, the *day after exercising*, and frequently confined to the bed. Many women thus diseased, cannot walk a long distance. This

affection is usually preceded and attended by costiveness. The appetite is faulty, skin dry, and the person very *nervous*. The latter is a very common occurrence. This complaint is one that is but little understood by ladies generally, yet very many are suffering from it.

The intestines becoming depressed, support is not given to the liver, which is situated on the right side, or to the spleen, which is situated on the left side; consequently, these organs are depressed, causing pain in the side; the stomach also, not being supported properly by the intestines, sinks, causing a sensation of faintness, sometimes a sense of fullness and not unfrequently loss of appetite.

The diaphragm, letter C. fig. 99, not being duly supported by the liver and stomach, loses its convexity as seen at A, fig. 100, and due support not being given to this organ, it also loses its tone and contractile power, and sinks below the straight line seen at L. fig. 99, and becomes convex downwards, as seen at L. fig. 100. When the diaphragm assumes this position, there is a flattening of the chest, also an irregular action or palpitation of the heart, shortness of breath, cough, feebleness and inability to speak.

The symptoms above alluded to, not unfrequently cause the individual thus affected to lean forward, to force the depressed organs upwards. The nerves of these deranged organs become irritated, and this irritation is transmitted to the spinal marrow or pith of the back bone, pain and weakness of the limbs, particularly the lower extremities follow this condition of the nerves, which renders the person extremely nervous.

The large and small intestines, need the stimulation of the active contraction of the abdominal muscles and diaphragm, to keep them in a healthy state, and when the tonic contractibility of both is diminished by this relaxed condition of the muscles, the bowels become inactive, producing constipation or costiveness, or this, alternating with a diarrheal discharge.

Contraction followed by relaxation is a law of the muscular system. But in fever, and chronic diseases of

the lungs, heart, stomach, liver, and intestines, the muscles or flesh become soft and flabby, attended with feebleness, and frequently relaxation, and these muscles having lost in a measure the power of contracting, become permanently relaxed. As the abdominal muscles assume the relaxed state with other muscles of the system, the intestines sink to the lower part of the cavity as before described, and while thus enfeebled, they cannot give due support to, or raise the already depressed organs.

If a piece of India Rubber be extended, being attached at each end to fixed points, and a weight be put in the centre, it will yield by still further elongation, and the centre will become depressed. While the *weight* remains, the rubber will not contract, so as to elevate the central, depressed portion to a level with the points of attachment. So it is with the relaxed abdominal muscles. They are enfeebled and overstrained by the weight of the intestines, and as long as this condition exists, the muscles cannot contract or shorten, so as to elevate the internal organs, as seen in fig. 100, to their natural position as seen in fig. 99.

If the weight be taken from the India Rubber, it will contract, and the depressed centre will be elevated. But the weight of the liver, intestines, &c. cannot be removed from the abdominal muscles, while life continues; consequently, relief by this means is not attainable. But the contraction of the rubber may be assisted, by support being given under the central depressed portion, and thus the centre will be elevated to a plane with the extremities. So a supporting cushion, or pad, may, and can be applied to the projecting abdomen, at C. fig. 100. The muscles thus supported and assisted, will be enabled to contract and bring the abdominal organs into a healthy and natural position.

The following cut represents a Spino Abdominal Supporter, invented by Calvin Cutter for the relief of this relaxed condition of the muscles, which occurs in the male and female system. A *side* and *front* view of the

instrument, and the manner in which it is applied, is given in fig. 101 and 102.

Support is given by this instrument, to the lower protruding part of the abdomen, seen at C., fig, 100. On examining this figure, it will be seen that it is necessary to make the pressure not only backward, but upward at the same time. By the oblique position of the front elliptic spring, and the upward direction of the lateral main spring, this compound pressure is effected.

In instances where bandages are thrown around the weakened and depressed bowels, the pressure is only backward, and the bandages are usually applied too far above the protruding bowels to give the required support.

As the muscles of the system are elastic, so should all supporting articles possess the same quality. In the instrument represented by fig. 101 and 102 the elasticity is obtained by means of elliptic and spiral springs; and so elastic is it, that it yields to every movement of the ribs and bowels; consequently it is worn with ease and comfort by lady or gentleman. The lateral pads give support to the large intestines, liver and stomach. The upward and backward pressure given at the same time by this instrument, is not to be found in any other mechanical support used for this kind of ailment.

By the upward pressure of the front pad, the contraction of the abdominal muscles in front is effected, causing an elevation of the intestines; and this elevation frees the bladder, as seen in fig. 100 and brings the organs into their proper situation, as seen in fig. 99. By this mechanical support, gravel, and urinary complaints are relieved and cured. Thus every individual afflicted with such complaints, would avoid much suffering, when standing, walking, or lifting, by support of this kind.

The uterus, also, being relieved of the unnatural weight of the intestines, as seen in fig. 100, will rise to its natural position, as seen in fig. 99. The bearing down pains experienced by females, the leucorrhea and its attendant symptoms will be remedied—the intestines being elevated and brought to their natural position—the liver, upon the

Fig. 101.

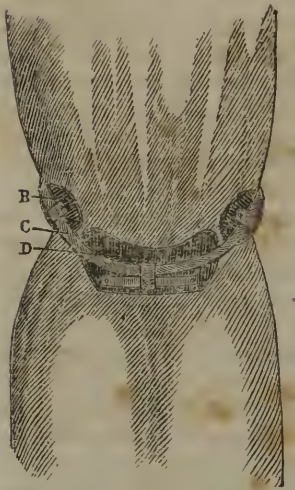
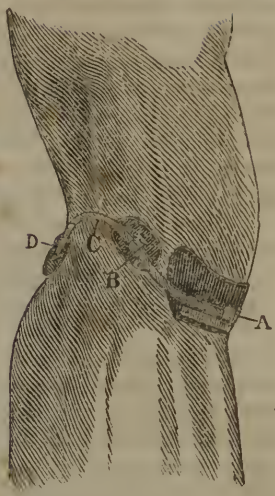


Fig. 102.



D, in fig. 101, and A. 102, represent an elastic front pad; upon this front pad is an elliptic spring, placed obliquely to the pad. This spring is attached to the band connecting the two lateral main springs by a clasp. The lateral or main spring extends upward over the haunch bone, on both sides, seen at C. Above the front pad, and within the haunch bone, upon each side, there is attached to the main lateral spring, two lateral elastic pads, shown by B, in figs. 101, and 102. At the posterior extremity of each of the lateral springs, an elastic pad is attached, seen in fig. 102, at D.

right side,—the stomach and spleen on the left, will be duly sustained by their elevation; and from this cause the tension of their ligaments will be removed, and pain in the side relieved. The stomach being properly supported. the faintness, flatulency, and distress after taking food will be remedied. The liver and stomach being sustained in their natural position, due support will be given to the diaphragm, and thus favor its healthy contractile action. The heart and lungs receiving due support from the internal organs at their base; shortness of breath, palpitation of the heart, cough, difficulty of speaking are removed upon Physiological principles.

These organs, viz. Heart, Lungs, Stomach, Liver, and Intestines, assuming their natural position, the irritat-

ed nerves of the spine will become healthy, and thus relieve the pain of the limbs and back. The intestines being supported by their appropriate muscles, the leaning and stooping posture is not called for, and through the erect posture, the weakness of the muscles of the back is at once relieved. The relaxed abdominal muscles, and diaphragm, being sustained, the intestines are thereby stimulated to a healthy and efficient action, preventing and *curing* that inactive state of the bowels, termed costiveness, as well as diarrhea, with colic pains, together with that painful disease, the piles. The pain at the lower part of the back is relieved by the support given by the back pads.

There are thousands in the community, now laboring under the symptoms before described, who have taken all the popular remedies for diseases of the liver, lungs, stomach, bowels and spine, without benefit, which may be cured in a few weeks by the above described mechanical means.

The understanding, clear-headed physicians, are now directing their attention to this method of medication.

Objections are sometimes raised, that they may do injury. To this, I will invite your attention. The instrument is applied to the lower part of the bowels and back, as seen in fig. 101 & 102. The lateral springs are immediately above the haunch or hip bone. The large blood vessels, and nerves, the liver, heart and lungs receive not the least compression, and in this it differs materially, from the corset lacing process. The pressure of the front pad is upward, and it is made with no more uneasiness, than pressure not unfrequently made by the hand. Pressure upward is grateful, and attended with little or no pain, whereas, pressure backward, is attended with pain and uneasiness. The objections against compression of the chest and *upper* part of the bowels, cannot be brought against pressure being made at the lower part of the bowels on physiological principles.

Another objection that may arise, is, that the instrument once used it must always be worn. This is not true. A muscle that is kept a long time in a state of un-

natural tension, becomes exhausted, and loses the power of contraction. A proof of this is shown in an over-strained muscle.

The muscles of an arm when kept in a sling for a long time become contracted or shortened, and when taken out, it is with difficulty that the arm can be extended. The reason is, that the muscles acquire an increased contractile power. the same results will follow the mechanical support to the abdominal muscles. They are relaxed, and need an increased degree of contractile power. This they cannot acquire, while compelled to support the bowels in their enfeebled, weakened state. Support them for a few weeks, and the fibres of the muscles, will acquire their contractile energy; and when this is obtained, they will support the bowels without foreign aid.

The truth of the above statements, I have seen verified in many cases. Many certificates of cure might be given, both from physicians and patients, of the following character.

Case 1.—Dr. K. of H., Mass., was frequently called to Mrs. B., who was afflicted with costiveness, female weakness or leucorrhea, pain in the sides and lower part of the back, a bearing down sensation when walking or standing, difficulty of urination, and faintness at the stomach; these symptoms were much increased by continued rapid exercise, which rendered her extremely nervous. She had taken much medicine, of both mineral and botanical character, but had found only temporary relief—finally, Dr. K. recommended the trial of an abdominal supporter, which was procured, and gave permanent relief. Mr. B. called on the Physician, two years after, to thank him, for his last, and effectual prescription, saying, at the same time, that the instrument had saved him more than one hundred dollars.

Case 2.—Dr. H., of Providence, R. I., was visited by a lady from Mass. to obtain relief, in a case of similar symptoms, described in Case 1. She left home, thinking it would be necessary to remain there six or eight weeks. Dr. H. after an examination of her case, advised a small portion of common aperients, and obtain-

ed for her a supporter. After using the supporter two weeks, she returned to her family cured—not by medicine, but by mechanical support to the abdominal muscles.

Case 3.—Mrs. W., of H., Mass., consulted Dr. C., of W. for a weakness of the bowels, difficulty of urination, shortness of breath, cough, &c. Dr. C. directed that she should give attention to the skin by bathing, and flannel clothing, also, some mild opening medicine, and applied likewise, a Spino Abdominal Supporter. In a few days, the cough and other symptoms were relieved.

Case 4.—Mr. H., a tailor, of S., Mass. had been afflicted with pain in the left side for many years. Cupping, leaching, blistering, liniments, and washes had been tried with no avail; I applied a Spino Abdominal Supporter—in one week, the pain left the side, and has not since returned.

Case 5.—Mr. H. had been at the South, and returned with a severe liver affection, dyspepsia, with severe pain in the bowels. He obtained on trial, a Spino Abdominal Supporter, and in two days, his pains and aches disappeared. He laid it aside, and concluded not to purchase it, as he was poor—but the pain returned—he resumed the use of the instrument, and found relief. Having thus fairly tested the utility of the instrument, he forthwith purchased it.

The Spino Abdominal Supporter before described, was patented by Calvin Cutter, M. D., of Massachusetts, Dec. 15, 1844. It was presented at the Mechanics' Fair, in Boston, Sept. 16, 1844, and the following is the testimony of the examining Committee. "There are added some decided improvements to the Abdominal Supporter by means of his spiral springs; and the Committee, from their personal experience in these matters, can safely recommend these instruments to the public."

The above is the testimony of Dr. Lewis, and other leading physicians of Boston.

The following is the testimony of the editor of the Bos-

ton Medical and Surgical Journal of Feb. 5, 1845. He says,—

"It is an abdominal supporter, unlike any contrivance, with which the profession are familiar. We shall not attempt to describe it further than to mention that spiral spring are introduced, in a way to keep the abdominal pad always pressing upward and slightly inward. Nothing could fit better, or more completely fulfil the intentions of mechanical support in the lower part of the bowels."

The general Agent of New England for the sale of Cutter's Patent Spino Abdominal Supporter, is N. HUNT, 128 Washington Street, Boston.

Cutter's Supporters can also be obtained of

in and

in

and by